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"Colorado River Drought Conditions and Response Measures"

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Chairman Huffman, Ranking Member Bentz, and Members of the Subcommittee, my name is Patrick Tyrrell. I am Wyoming's Commissioner to the Upper Colorado River Commission and Wyoming's Governor's representative regarding the Colorado River. Thank you for providing me the opportunity to present testimony on behalf of the State of Wyoming about Colorado River Drought Conditions and Response Measures.

Colorado River Drought Conditions

The ongoing drought in the Colorado River Basin is well known and well documented. The Basin is experiencing its worst drought in over 100 years of record-keeping, and one of the worst in the past 1,200 years. The period from 2000 through 2021 is the driest 22-year period on record with natural flow in the Upper Colorado River Basin at 84% of the long-term average of 14.68 million acre-feet (MAF) based on the period from 1906 to 2021. Water Year 2021 was the second driest in the historical record, with the unregulated inflow into Lake Powell being about 33% of average.

Lake Mead is experiencing historically low storage. On August 16th, the Bureau of Reclamation (Reclamation) issued its August 24 month study. Due in part to ongoing historic drought and low runoff conditions in the Colorado River Basin, releases from Lake Mead will be reduced in 2022 representing the first "shortage" declaration in the Lower Basin. The declaration will require the following water reductions and contributions: Nevada will leave 21,000 acre-feet in Lake Mead (7% of the state's annual apportionment); Arizona will leave 512,000 acre-feet in Lake Mead (18% of the state's annual apportionment); and Mexico will leave 80,000 acre-feet in Lake Mead (5% of the country's annual allotment). Despite robust conservation activities in the Lower Basin since 2014 which have increased the elevation of Lake Mead by an estimated 50 feet, recent projections predict an almost certainty that shortages in the Lower Basin will continue over the next several years, and it's likely that even greater water reductions and contributions will occur by 2024.

At Lake Powell, Reclamation's projections indicate the potential of falling below the minimum power pool elevation as early as July 2022 should extremely dry hydrology continue into next year. Beyond 2022, the chance Lake Powell could fall below minimum power pool ranges from

about 25% to 35%. There is an almost 90% chance Lake Powell will fall below elevation 3,525 feet next year, an elevation the Upper Basin is trying to protect. That target elevation provides a 35 vertical-foot buffer designed to minimize the risk of dropping below the minimum power pool elevation of 3,490 feet and balances the need to protect the infrastructure at Glen Canyon Dam and meet operational obligations to the Lower Basin States of Arizona, California and Nevada.

The effects of these historic drought conditions are not limited to an isolated region, and they are not limited to the major basin reservoirs. Rather, they extend from the headwaters in Colorado and Wyoming, through each Upper and Lower Basin State, and into Mexico. Further, projections and various modeling analyses suggest the prospects of improved water supply cannot be relied upon for future planning and decisions. We need to plan for continuing bad hydrology, and, like the drought, response measures need to extend to the entire basin rather than isolated regions.

Wyoming's Colorado River Basin and Drought Conditions

Water users in Wyoming continue to experience significant water shortages due to the extremely dry conditions. Currently, all of Wyoming's Colorado River Basin is suffering from either severe or extreme drought. The extended and current drought conditions have and will continue to impact Wyoming water users in significant ways. Impacts to irrigated agriculture from the exceptionally low flows in water year 2021 are just the latest example.

Unlike most water users in the Lower Colorado River Basin, Wyoming water users do not have large upstream reservoirs like Lakes Powell and Mead in which to save supplies for use in water short years. Instead, Wyoming users rely on snowmelt and are subject to whatever water is available in the rivers and streams. When the water supply is not sufficient to supply all water rights, the earliest, most senior water rights get satisfied first, and the junior water rights get turned off by Wyoming water officials. When there is not enough water available, they simply get no water.

The conditions in the northern portion of Wyoming's Green River Basin during 2021 illustrate this situation. Many streams in this basin do not have supplemental storage water for late season supply. Due to low stream flows and early runoff, regulation of those streams—the turning off of junior water rights—began in mid-June and continued throughout the remainder of the water year. They were regulated to priority dates dating from the 1880s and 1890s. This means water rights with priority dates of about 1900 and later were regulated before mid-way through Wyoming's short growing season. Instead of receiving their full supply of water for five months, they received that water for only about two months. Approximately 68,000 acres with valid water rights from these streams were subject to regulation.

The southern portion of Wyoming's Green River Basin and the Little Snake River Basin experienced similar drought conditions in 2021. Due to low stream flow conditions, the southern Green River Basin tributaries experienced regulation beginning in early May and continuing throughout the remainder of the water year. Water rights with priority dates later than 1890 in some instances did not receive natural flow supplies for most of the year. However, unlike most of the northern Green River Basin tributaries, there are some smaller storage facilities in the southern Green River Basin which helped supply supplemental storage water to some of those

rights which were otherwise prevented from diverting natural flow. Those smaller reservoirs are currently between 6% and 27% full. Similarly, many irrigation rights in the Little Snake River Basin were forced to start relying on storage water instead of natural flow beginning in about mid-July. The primary reservoir in that basin is now only 27% full. While the existing storage in these basins certainly aids in providing a late season supply to Wyoming water users, it only aids those who have a right to the storage. Many water users are simply at the mercy of whatever flow the streams provide.

Over the course of the last 22 years of drought in the Colorado River Basin, Wyoming water users have routinely suffered shortages. Some years are worse, some are better. These routine shortages occur even though Wyoming has developed less than 2/3 of its Compact apportionment under a full supply. During the drought years, Wyoming water use reduced more than 20% compared to years when water was more plentiful. These shortages get little attention and require no federal declaration, but they happen nevertheless and carry with them attendant economic impacts. Response measures intended to address the drought in the Colorado River Basin should not only focus on main stem storage and uses, but also uses at the top of the Basin like those in Wyoming.

In response to the continuing drought in Wyoming's Colorado River Basin, on July 16th Governor Mark Gordon convened a Wyoming Colorado River Working Group to meet regularly to discuss Colorado River issues and monitor potential impacts to Wyoming. The group is made up of representatives of key water use sectors of Wyoming's Green and Little Snake River Basins, including agricultural, municipal, industrial and environmental interests. It will discuss and share Colorado River information with interested stakeholders in Wyoming's Green and Little Snake River Basins. The Working Group is a continuation of a coordinated and proactive outreach effort that has been underway in Wyoming since 2019.

Drought Response Measures

Continued Collaboration in the Colorado River Basin

Collaboration will continue to be key in responding to drought. In response to the last two decades of historically dry hydrologic conditions and higher than normal temperatures, the Basin States, Reclamation, and Mexico have collaborated to implement unprecedented, innovative, and proactive measures, including the 2007 Interim Shortage Guidelines; binational Minutes 318, 319, and 323; the 2019 Drought Contingency Plans (DCPs); and other important water conservation, storage, and augmentation efforts.

Despite the severe hydrologic and water supply challenges, these measures have allowed the Basin States to continue to satisfy water needs, meet Treaty and Compact obligations, and fulfill environmental commitments, all while ensuring no one is left behind and no one unfairly bears the brunt of these necessary efforts. Wyoming is committed to continue to approach challenges with the same focus on collaboration and equity as the Basin faces worsening hydrology.

As the Basin States and Reclamation begin working on longer-term solutions to the shared risks and vulnerabilities we face in the Colorado River system, we will also be preparing for the development of the post-2026 Colorado River operating rules. Generally, the development of the

post-2026 guidelines is expected to be focused on the management and operations of the Colorado River reservoir system. While each of the Basin States may have guiding principles or specific goals and objectives associated with developing the post-2026 guidelines, Wyoming is resolutely committed to working together to make the system work for all.

In addition to individual state efforts like those in Wyoming, the Basin States intend to coordinate and communicate with the Department of the Interior leadership, Basin Tribal leaders, NGO and environmental representatives, water users, and other stakeholders. The Basin States also expect that, in conjunction with the two sections of the International Boundary and Water Commission and the Department of the Interior, similar outreach and discussions will be held with Mexico in the near-term. Outreach efforts will require that multiple, parallel discussions occur alongside the formal NEPA process led by the Department of the Interior. While it will not be possible for everyone to be involved in every discussion, it will be important for the States to coordinate the various parallel discussions. Collaboration will continue to be key in responding to drought.

Upper Basin Drought Contingency Plan

Both the Upper Basin and the Lower Basin continue to implement the 2019 DCPs. The Upper Division States of Colorado, New Mexico, Utah, and Wyoming, along with Reclamation, are implementing the Upper Basin DCP. The principal goal of the Upper Basin DCP is to help assure continued compliance with the 1922 Compact. It does so by helping protect critical elevations at Lake Powell. Protecting those elevations reduces the risk that the Upper Basin will fail to meet its compact obligations. The Upper Basin DCP as approved by Congress in 2019 consists of two agreements:[1] The Drought Response Operations Agreement (DROA) and the Demand Management Storage Agreement.

The DROA applies to the 1956 Colorado River Storage Project Act (CRSPA) Initial Units. The CRSPA Initial Units are Glen Canyon Dam, Flaming Gorge Dam, Curecanti (the "Aspinall Unit"), and Navajo Dam. The Agreement relies on available water supplies as needed to reduce the risk of Lake Powell dropping below the target elevation 3,525'. This target elevation appropriately balances the need to protect infrastructure, compact obligations, and operations at Glen Canyon Dam as storage approaches minimum power pool, with the Upper Division States' rights to put Colorado River System water to beneficial use.

In July of 2021, Reclamation exercised the imminent need provisions of the DROA and began making releases from the upstream Initial Units to Lake Powell. Those DROA releases were designed to deliver an additional 181 thousand-acre feet of water to Lake Powell by the end of December 2021. The additional delivery was expected to raise Lake Powell's elevation by approximately three feet. Reclamation and the Upper Division States are now working together to develop and finalize, if necessary, a DROA plan in 2022. They expect to have a draft plan to provide for stakeholder outreach and feedback by the end of 2021.

[1] Although not part of the DCP package approved by Congress in 2019, the Upper Basin DCP also includes a weather modification program within the Upper Division states to help boost snow accumulation and system water in the Upper Colorado River Basin. Several Lower Basin water utilities and entities participate and help fund the ongoing program.

Drought response operations are a first line of defense to protect critical elevations at Lake Powell. But that existing storage is not infinite and cannot protect Lake Powell under many of the dry scenarios now being projected. If dry conditions persist or worsen as many project, existing storage will diminish or be inadequate, and the Upper Basin may ultimately need to reduce its uses to comply with the 1922 Compact.

The Demand Management Storage Agreement authorizes the Secretary of the Interior to make unfilled storage capacity at the CRSPA Initial Units available for use by the Upper Division States, through the Upper Colorado River Commission (UCRC), at no charge. Such storage capacity is available provided that the UCRC requests use of the storage capacity for the purpose of storing water conserved as part of an Upper Basin demand management program. Once the Upper Division States secured this storage authorization in 2019, they, along with the UCRC, began investigating the feasibility of an Upper Basin demand management program.

The purpose of an Upper Basin demand management program will be to temporarily reduce consumptive uses in the Upper Basin or augment supplies with imported water, if needed in times of drought, to help assure continued compliance with Article III of the 1922 Compact and without impairing the right to exercise existing Upper Basin water rights in the future. Any demand management program will be a state-based effort implemented under state law. The Upper Basin has learned that no demand management program is likely to conserve enough water in any single year to achieve its goals. Therefore, an Upper Basin demand management program will require the ability to store conserved water over multiple years.

There are many outstanding issues that must still be investigated before an Upper Basin demand management program can be established. Those issues include, among other things, determining transit losses that will occur by moving conserved water downstream to Lake Powell, securing sufficient demand management water volumes, measuring conserved consumptive use volumes, evaluating local impacts from non-use, ensuring delivery of conserved consumptive use volumes to the CRSPA Initial Units without diminishment by downstream diverters, deterring water right speculation at the expense of agricultural communities, and developing the expertise and resources necessary to administer such a program. These issues, as well as others, are complicated by the fact that a demand management program must work in all four Upper Division States where differing water laws apply. Funding is another significant issue. Considerable funding will be necessary to compensate water users for their voluntary participation in the program for conserving consumptive uses.

Each of the Upper Division States, and the UCRC, continue to investigate the feasibility of a potential demand management program. But as described above, both the DROA and the Demand Management Storage Agreement are primarily intended to help assure continued compliance with the 1922 Compact. They do not address drought impacts in the Upper Basin but are instead designed to maintain downstream obligations to the Lower Basin.

Additional Drought Response Measures

There are numerous additional drought response measures which can be effective at helping water managers at all levels address the uncertainties threatening the Basin. Wyoming, alongside the other Basin States, recently expressed to the House Natural Resource Committee its general support for many investments and opportunities designed to respond to drought.[2] Wyoming continues to support securing authorizations and appropriations within proposed federal legislative initiatives related to those investments and opportunities. I would like to reference just a few of those investments and opportunities here:

- Storage Water Infrastructure: We must continue to invest in the aging water infrastructure necessary to meet current and future demands for water. Existing water infrastructure in the west is getting older and is in desperate need of expensive rehabilitation and improvement. Additionally, we must invest in additional storage in response to more variable hydrology and earlier runoff (earlier runoff results in less ability maintain existing uses). Small, watershed level storage can help address the types of shortages faced by Wyoming's agricultural water users in the Green and Little Snake River Basins. Further, storage provides additional water management flexibility to better meet downstream municipal and industrial water needs, improve flood control, generate clean hydropower, provide recreation opportunities, and create additional late season flows that can benefit downstream aquatic and terrestrial species.

- Funding for DCPs: Existing arrangements under the Lower Basin DCP and related Treaty Minute 323 with Mexico commit the federal government to create or conserve 100,000 acre-feet of Colorado River system water in the Lower Basin and to share in funding with Mexico for management and monitoring projects. Making the necessary investments to honor these commitments remains vital to ongoing drought response and stability in the Basin. Additionally, funding for the Upper Basin DCP can help assure those tools are implemented as intended, aid in more accurately representing Upper Basin uses and circumstances in existing and future planning tools, and enhance the potential that the existing DCP measures continue as future operating options.

- Species Protection Programs: The continued authorization (H.R. 5001) and reliable funding of threatened and endangered species programs remains vital to maintaining fish and wildlife protections in and around the Colorado River Basin. Reliable funding will become even more critical as power revenues decrease due to shrinking reservoir elevations. These programs are important not only for the benefit of the various species, but also to ensure water uses can develop and continue. Examples of important programs include the Upper Colorado River Endangered Fish Recovery Program, the San Juan River Recovery Implementation Program, the Glen Canyon Dam Adaptive Management Program, Multi-Species Conservation Program, and the Salton Sea Restoration Program.

[2] Colorado River Basin States Representatives of Arizona, California, Colorado, New Mexico, Utah, and Wyoming in Support of Nevada Responses to Questions for the Record, letter to The Honorable Raúl M. Grijalva, Chairman, House of Representatives Natural Resources Committee, dated June 28, 2021.

- Improve Water Monitoring, Measurement and Weather Forecasting: Accurate data and information is critical for planning decisions regarding reservoir storage and releases, and improving the ability to readily adapt to extreme weather events and shifts in climate. Improved water measurement, such as funding for streamgages that are identified as Federal priority streamgages, will be critical to not only inform planning decisions, but also to implement existing tools such as the Upper Basin DCP. Accurate water measurement will also be necessary to properly implement elements of the Law of the River. The USGS should coordinate with the Upper Basin States to site streamgages within the Basin where they can be the most effective for these purposes.

  More must be done to accurately measure existing consumptive uses throughout the Basin, but especially in the Upper Basin. 80% of the total consumptive use in Wyoming's Colorado River Basin consists of the evapotranspiration (ET) of water through the irrigation of crops. Unfortunately, ET is the component of water use that is technically the most difficult to accurately estimate, which makes it difficult for water managers to plan and make decisions. While accurate satellite-based methods at the field scale are available, they are expensive and labor intensive, and therefore not easily accessible to those that would benefit from them most including water managers and the water users themselves. OpenET would help fill this data gap. The new software platform would provide cost effective and rapid online access to this key water use variable. It would also allow the means by which all users across the Basin States can better understand consumptive use. It can also help farmers and ranchers use water more efficiently and help water managers monitor historic and current water use, all using open and transparent data. Wyoming strongly encourages Congress, through legislation such as H.R. 4832, to provide OpenET funding and a "home" within an agency in the Department of the Interior (either Reclamation or USGS) so that OpenET can continue to be developed to fill this critical data gap.

- Incentivize Municipal Conservation and Infrastructure: In coordination with Colorado River Basin partners, programs should be continued and improved to incentivize implementation of municipal conservation technologies, including indoor and outdoor programs for potable use. These programs should be broad enough to not only include some of the largest municipalities in the Basin, but also smaller municipal providers like those in Wyoming.

More is needed to help ensure the Basin's resilience to higher temperatures, changing precipitation patterns, and pronounced storage fluctuations going forward. As previously described by the Basin States, the most immediate needs include ensuring that federal commitments under the Drought Contingency Plans can be met, securing access to clean water for tribal communities, and securing authorization and long-term funding for species recovery programs. In the long-term, there is a need to focus on a broad range of investments and opportunities, including: Large-scale augmentation, facilitating system conservation within existing authorities, promote watershed health, promote forest restoration and management including wildfire mitigation and protection, improvement of agricultural operations and infrastructure, incentivize municipal conservation

(including large scale re-use projects), and improve water supply forecasting, measurement as well as monitoring to project future Basin conditions and inform decisions.

Conclusion

The Colorado River Basin is currently experiencing some of the worst drought conditions in recorded history. The effects of these conditions are not limited to an isolated region but extend across the entirety of the Basin. Drought response measures must equally stretch across the entirety of the Basin. It is also imperative to recognize that not all the actions can be implemented uniformly across the Basin. Success will require development and implementation across federal agencies in cooperation and partnership with the Basin States, Tribes, water users, and other stakeholders. Wyoming is ready and willing to engage in the collaborative efforts necessary to build and sustain water resiliency throughout the Basin, and to provide more information on the types of investments and opportunities most likely to help ensure the Colorado River Basin continues to support a thriving economy and a durable environment.

Thank you for the opportunity to testify here today. I am happy to answer any questions you may have.