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RE: Drought Response Operations Agreement (DROA); Upper Basin Division.

INTRODUCTION

This comment letter for the development of Drought Response Operations Agreement (DROA) in the Upper Basin is provided by Living Rivers, Colorado Riverkeeper and Center for Biological Diversity.

We are attaching the 24 documents that are cited in this comment letter. For your convenience this record can be securely downloaded as a zip file (34 MB) from this url address:

<http://www.riversimulator.org/2025Guidelines/USBR/DROAub.zip>

Our main concern is the water column at Lake Powell will fall below elevation 3520 feet in the very near future. This elevation allows entrained air to enter the water flowing by gravity through the penstocks that spin generators and make electricity; the consequent cavitation will seriously damage this embedded infrastructure. Thereafter, modified operations at Glen Canyon dam will accelerate impacts to the aquatic resources of Grand Canyon National Park and challenge the established management protocols that are intended to comply with the Grand Canyon Protection Act of 1992.¹

Our other concern is the states of the Lower and Upper Divisions have understood the consequences of global warming since 2005, but have yet to provide a successful plan that balances the water budget of the Colorado River Basin (CRB).²

¹ Grand Canyon Protection Act, 1992. <http://www.onthecolorado.com/Resources/LawOfTheRiver/GCPA1992.pdf>

² Article by Brian Maffly for Salt Lake Tribune, 2021. <http://www.riversimulator.org/2025Guidelines/News/2021/LakePowellLevelAboutToHitHistoricLowAsWestsWaterCrisisDeepens2021MafflySLT.pdf>

FUTURE CONDITIONS

Management in the Colorado River Basin (CRB) is dependent upon the following future conditions:

- (1) Until an international climate adaptation agreement is achieved to reduce greenhouse gas emissions, present-day proposals, such as DROA, will not be sustainable, nor resilient.
- (2) CRB water managers must accept that discussions about large-scale water augmentation and storage projects involve decade-long conversations with outside communities about difficult political, financial, environmental, and legal issues. The managers of this river basin must focus, and correctly resolve, an urgent in-house water scarcity problem without further delays or distractions.³
- (3) Since the beginning of the Holocene Epoch the Arid Lands have been in a state of water depletion and water managers must be responsive to long-term aridity, rather than short-term drought.⁴
- (4) This permanent cycle of aridity will be interrupted by random pluvials, but such events will not change the trajectory toward diminishing natural flow, and for time-periods greater than the next 100-years.⁵
- (5) Unless consumptive use is reduced immediately by a factor of 20%, the reservoirs are destined to be empty for decades (see 2012 Basin Study projections in the 10th percentile).⁶ This reduction of consumptive use will need to keep pace with the 30-year average, which is revised every 10-years and has consistently dropped 800,000 acre-feet per decade since 1991.⁷
- (6) If the desire of water managers is to rebuild the lost storage of the last two decades, then the reductions in consumptive use must be at least 25%.

³ Article by Jennifer Sensiba of Clean Technica, 2021.

<http://www.riversimulator.org/2025Guidelines/News/2021/CanWaterMegaprojectsSaveTheUSDesertWest2021JenniferSensibaCleanTechnica.pdf>

⁴ Connie Woodhouse, et al, 2010. <http://www.riversimulator.org/Resources/ClimateDocs/1200YearPerspective21CenturyDroughtSouthwesternNorthAmericaWoodhouse2010.pdf>

⁵ Stationarity is Dead: Whither Water Management; Milly et al., 2008.

<http://www.riversimulator.org/Resources/ClimateDocs/MillyBetancourt2008.pdf>

⁶ Technical Report G - System Reliability Analysis and Evaluation of Options and Strategies.

<https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/techrptG.html>

⁷ Annual Operating Plan online archive at USBR website: <https://www.usbr.gov/uc/water/rsrvrs/ops/aop/index.html>

- (7) Water efficiency programs must factor compensations from heat stress, i.e., increased overall evaporation and reduced soil moisture. Water efficiency programs have limitations and are not resilient and sustainable, overtime.⁸
- (8) In conclusion, we recommend that the law of the river be modified to support resiliency and sustainability for the communities dependent upon the CRB; this includes Mexico and the tribes as sovereigns with equal standing.^{9 10} Our organizations have standing to support the river's aquatic ecology as a living community.

THE CRB PASSED PEAK WATER IN 2003

Article III and Mexican apportionments peaked when the Annual Operating Plan (AOP) of 2003 was signed by Secretary Gale Norton. Since 2003, intakes have been lowered into the dead pool column at Lakes Mead¹¹ and Powell,¹² and power plant turbines¹³ were replaced to compensate for low-head reservoir conditions. These actions indicate that water managers understand the negative direction of future reservoir conditions in the CRB.

MODIFYING LONG RANGE OPERATING CRITERIA

In 2005 long-range operating criteria (LROC) were modified with a sense of urgency due to reservoir levels falling dramatically. Rather than reduce consumptive use to balance the water budget, the states of the Upper and Lower Divisions stated that they would improve system efficiency so that development in the basin could continue without changing the law of the river.¹⁴

⁸ Colorado River Basin Hydrology Forecasts Paint Grim Picture, 2021; Kanzer for CRWCD. <http://www.riversimulator.org/2025Guidelines/News/2021/WaterSupplyForecast2021KanzerCRWCD.pdf>

⁹ Community in the Colorado River Basin, 2021; Robinson et al. <http://www.riversimulator.org/Resources/LawOfTheRiver/CommunityInTheColoradoRiverBasin2021RobisonIdahoLR.pdf>

¹⁰ Green Light For Adaptive Policies On The Colorado River & Supplementals, 2021; Fleck and Castle. <http://www.riversimulator.org/2025Guidelines/Solutions/GreenLightForAdaptivePoliciesOnTheColoradoRiverAndSupplementals2021Fleck.pdf>

¹¹ Lake Mead Intake No. 3; Hurt, 2017. <http://www.riversimulator.org/Resources/ClimateDocs/LakeMeadIntakeNo32017Hurt.pdf>

¹² Water Intake Project For Navajo Generating Station; NPS, 2007. <http://www.riversimulator.org/2025Guidelines/States/Intakes/WaterIntakeProjectForNavajoGeneratingStation2007NPS.pdf>

¹³ Article by International Water Power, 2010. <http://www.riversimulator.org/2025Guidelines/States/Intakes/AndritzWinsContractForNewTurbineRunnerAtHooverDam2010IWP.pdf>

¹⁴ <http://www.riversimulator.org/2025Guidelines/States/Seven/SevenBasinStatesPreliminaryProposalRegardingColoradoRiverInterimOperations3Feb2006.pdf>

The seven states agreed that these modifications would be effective for an “interim” time-period that would end upon the final draft of the 2026 AOP (18-years). The states also agreed to reconsultation should this experimental plan not succeed during the interim period. The plan did not succeed and why this opportunity to provide public comments about DROA has occurred.

The interim plan began to unravel In 2013 and 2014 and two conversations emerged amongst the water managers: (1) develop contingency planning documents (Drought Contingency Plans for both divisions (DCPs))¹⁵, and; (2) cap annual consumptive use in the Upper Basin to 5 million acre-feet (The Grand Bargain).¹⁶ The DCPs is the conversation that prevailed, which required five-years of negotiations; the Upper and Lower Division contracts were signed May of 2019. These contracts were modified yet again for the Lower Basin in December of 2021 (DROA). The Upper Basin modifications for DROA are the subject of this comment letter.

THE 30-YEAR AVERAGE

In 2005, when Secretary Norton prepared an Environmental Impact Statement called Shortage Criteria, the 30-year average was 12.04 million acre-feet (maf). When the contracts for Drought Contingency Planning (DCPs) for the Upper and Lower Divisions of the Colorado River Basin (CRB) were developed, the 30-year average was 10.83 maf. For the development of the Upper Basin Drought Response Operations Agreement (DROA), the 30-year average will be 9.6 maf. The 30-year average in 2031 will likely be 8.8 maf and as anticipated by regional atmospheric scientists.^{17 18}

TOTAL SYSTEM STORAGE

On the last year of the 20th century total system storage in the CRB was at 83% (2001 AOP).¹⁹ At the end of Water Year 2021, total system storage was 38%.²⁰ The system

¹⁵ Memo from Colorado Representative John McClow, 2014. <http://www.riversimulator.org/Resources/States/McClowCWCBMemoToStakeholdersFeb2014.pdf>

¹⁶ The "Upper Basin Voluntary Demand Cap" as a Means of Mitigating Legal Uncertainty in the Colorado River Basin; Doug Kenney, 2013: <http://www.riversimulator.org/Resources/LawOfTheRiver/UpperBasinVoluntaryDemandCapMeansOfMitigatingUncertaintyCRGI2013.pdf>

¹⁷ Archive of Annual Operating Plans and 24-month Study Reports from 1971 to 2022; US Bureau of Reclamation and located at this website: <http://www.onthecolorado.com/resources.cfm?mode=section&id=Dam%20Operations>

¹⁸ Compilation of science papers by Overpeck and Udall, 2021: <http://www.riversimulator.org/Resources/ClimateDocs/ColoradoWaterClimateChangeAdaptation2021.pdf>

¹⁹ 2001 Annual Operating Plan (AOP) here: <https://www.usbr.gov/uc/water/rsvrs/ops/aop/index.html>

²⁰ January, 2022; 24-month Study Report; USBR and archived here. <http://www.riversimulator.org/24month/2022.01.pdf>

loss in this time-period was 25 million acre-feet, or 1.25 million acre-feet per year. This number is consistent with the drop in the 30-year average.

INVENTORY OF WATER SAVINGS

Year 2003 is when the Interstate Water Banking agreements began between Nevada, California and Arizona. This water was stored in closed-basin aquifers and the grand total is now about 944,000 acre-feet. The water savings here amount to 50,000 acre-feet per year. We commend the effort, but this number is insignificant compared to the downturn trend.

Independently, Arizona has committed 4.6 million acre-feet of water into aquifer storage facilities along the Central Arizona Project, and since 1996. The savings here amount to 209,100 acre-feet per year. Again, a commendable effort, but the scale is not sufficient under the present circumstances.

The voluntary savings/withdrawal program called Intentionally Created Surplus (ICS) began in earnest in Year 2013. As of Water Year 2020, 2.313 million acre-feet were retained in Lake Mead.²¹ This annual savings average between 2013 and 2020 averaged 355,000 acre-feet per year. This total number is actually quite embarrassing because ICS credits were lauded as the star program for the Record of Decision.²²

An effort to conserve water in the Upper Basin Division included a four-year pilot program from 2015 to 2018 that saved a total of 22,116 acre-feet.²³ According to the appendices found within the 2012 Basin Study, the scale of savings, via demand management strategies, may require the Upper Basin Division to prepare for shortages in amounts as high as 1.8 million acre-feet per year. The conclusion in Wheeler et al., 2021, is that shortages in the Upper Basin Division could range from 1.3 to 3.0 million acre-feet.²⁴

CONCLUSION

The point we are trying to convey is this: water savings must be in the range of millions of acre-feet, and not in the hundred-thousands. Additionally, saving water does not mean transferring or delaying the delivery of river water from one consumptive use to another. The immediate goal is to eliminate the expanding gap between demand and

²¹ 2020 Consumptive Use Report; Lower Division. <https://www.usbr.gov/lc/region/g4000/4200Rpts/DecreeRpt/2020/2020.pdf>

²² 2007 ROD, USBR. <https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf>

²³ Pilot Study Final Report, 2018; Upper Colorado River Commission: <http://www.ucrcommission.com/system-conservation-pilot-program/>

²⁴ Alternative Management Paradigms for the Future of Colorado and Green Rivers; Wheeler, 2021: <http://www.riversimulator.org/2025Guidelines/University/Futures/Summary/06.pdf>

supply and equitably balance the water budget of the CRB. Thank you for your kind attention.

Sincerely yours,

John Weisheit, co-founder of Living Rivers & Colorado Riverkeeper

Dr. Robin Silver, co-founder of Center for Biological Diversity