SEVENTY-SECOND ANNUAL REPORT

OF THE

UPPER COLORADO RIVER COMMISSION

SALT LAKE CITY, UTAH

SEPTEMBER 30, 2020

Upper Colorado River Basin

UPPER COLORADO
RIVER COMMISSION

355 South 400 East • Salt Lake City, UT 84111 • 801-531-1150 • www.ucrcommission.com

June 1, 2021

President Joseph R. Biden, Jr.
The White House
Washington, D.C. 20500

Dear President Biden:

The Seventy-Second Annual Report of the Upper Colorado River Commission, as required by Article VIII(d)(13) of the Upper Colorado River Basin Compact of 1948 ("Compact"), is enclosed. The report also has been transmitted to the Governors of each state signatory to the Compact, which include Colorado, New Mexico, Utah, Wyoming and Arizona.

The budget of the Commission for Fiscal Year 2021 (July 1, 2020 – June 30, 2021) is included in this report as Appendix B.

Respectfully yours,

Amy I. Haas

Amy I. Haas
Executive Director and Secretary

Enclosure

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PREFACE

Article VIII(d)(13) of the Upper Colorado River Basin Compact, requires the Upper Colorado River Commission (the Commission) to "make and transmit annually to the governors of the signatory states and the president of the United States of America, with the estimated budget, a report covering the activities of the Commission for the preceding water year."

Article VIII(1) of the By-Laws of the Commission, as updated, specifies that "the Commission shall make and transmit annually before July 1 to the Governors of the states signatory to the Upper Colorado River Basin Compact and the to the President of the United States a report covering the activities of the Commission for the water year ending the preceding September 30."

This Seventy-Second Annual Report of the Upper Colorado River Commission has been compiled pursuant to the above directions.

This Annual Report includes, among other things, the following:

- Membership of the Commission, its Committees, Advisers, and Staff
- Roster of meetings of the Commission
- Summary of the Activities of the Commission
- Engineering and Hydrologic Data
- Status of the Colorado River Storage Project (CRSP) Initial Units and other Participating Projects
- Appendices containing Commission financial data, such as budget, annual financial report, balance sheet, statements of revenue and expenses, and Commission resolutions.

A special thank you to the many staff of the United States Bureau of Reclamation (Reclamation) who have contributed significantly to the text of this Annual Report and the data presented herein.

COMMISSIONERS

John D'Antonio
Commissioner for New Mexico

Rebecca Mitchell
Commissioner for Colorado

Todd Adams
Commissioner for Utah

Patrick T. Tyrrell (Vice Chair)
Commissioner for Wyoming

Federal Chair
Vacant during the 2020 Water Year

ALTERNATE COMMISSIONERS

David Robbins	State of Colorado
John McClow	State of Colorado
Rolf Schmidt-Petersen	State of New Mexico
Benjamin C. Bracken	State of Wyoming
Randy Bolgiano	State of Wyoming
Keith Burron	State of Wyoming
Candice Hasenyager	State of Utah
Scott McGettigan	State of Utah

OFFICERS OF THE COMMISSION

Vice Chair	Patrick T. Tyrrell
Secretary	Executive Director
Treasurer	Executive Director
Assistant Treasurer	Deputy Director

COMMISSION STAFF

Executive Director	Amy I. Haas
Deputy Director/Chief Engineer	Sara G. Larsen
Staff Engineer	Don Ostler
Administrative Assistant/Office Manager	TeriKay Gomm

COMMITTEES

Committees and their membership at the commencement of the 2020 Water Year are as follows (the Chair and the Secretary of the Commission are ex-officio members of all committees, Article V(4) of the Commission By-Laws):

LEGAL COMMITTEE

Norman K. Johnson, Chair – Utah
Karen Kwon – Colorado
Peter Fleming – Colorado
Lee E. Miller – Colorado
Brent Newman – Colorado
Amy Ostdiek – Colorado
Lain Leoniak – Colorado
James S. Lochhead – Colorado
Bennett Raley – Colorado
Beth VanVurst – Colorado
Dominique Work – New Mexico
Arianne Singer – New Mexico
Chris Brown – Wyoming

ENGINEERING COMMITTEE

Steve Wolff, Chair – Wyoming
Mike Sullivan – Colorado
D. Randolph Seaholm – Colorado
John Currier – Colorado
Kyle Whitaker – Colorado
Michelle Garrison – Colorado
Brian Macpherson – Colorado
Paul Harms – New Mexico
Rolf Schmidt-Petersen – New Mexico
Ali Effati – New Mexico
David Jones - Utah
William Merkley - Utah
Scott McGettigan – Utah
Gawain Snow – Utah
Jared Hansen – Utah
Robert King - Utah
Charlie Ferrantelli – Wyoming

BUDGET COMMITTEE

Todd Adams, Chair – Utah
Patrick T. Tyrrell – Wyoming
Rebecca Mitchell – Colorado
John D'Antonio – New Mexico

GENERAL ADVISERS TO COMMISSIONERS

The following individuals serve as advisers to their respective Commissioner:

Gene Shawcroft – Utah

MEETINGS OF THE COMMISSION

During the Water Year ending September 30, 2020, the Commission met as follows:

Meeting No. 286 December 11, 2019	Las Vegas, NV
Meeting No. 287 May 19, 2020	Via webinar
Meeting No. 288 June 16, 2020	Via webinar

ACTIVITIES OF THE COMMISSION

GENERAL ACTIVITIES

Within the scope and limitations of Article I(a) of the Upper Colorado River Basin Compact of 1948 and under the powers conferred upon the Commission by Article Vlll(d), the principal activities of the Commission have consisted of: 1) research and studies of an engineering and hydrologic nature of various facets of the water resources of the Colorado River Basin, especially as related to operation of the Colorado River reservoirs; 2) collection and compilation of documents related to the utilization of waters of the Colorado River System for domestic, industrial and agricultural purposes, and hydroelectric power generation; 3) legal analyses of associated laws, court decisions, reports and issues; 4) participation in activities and provision of comments on proposals to ensure and allow the beneficial consumptive use of water in the Upper Basin, including for environmental, fish and wildlife and endangered species purposes, and water quality activities; 5) cooperation with water resources agencies of the Colorado River Basin States on water and water-related issues; 6) engagement in activities designed to aid in securing planning and investigation of storage dams, reservoirs, and water resource development projects of the Colorado River Storage Project that have been authorized for construction, and to secure authorization for the construction of additional participating projects as the essential investigations and planning are completed; and, 7) analysis and study of federal water resource legislation.

SPECIFIC ACTIVITIES

The Commission, its full-time staff and the Engineering and Legal Committees have been actively involved in matters pertinent to the administration of waters of the Colorado River. In addition to Commission meetings, many informal work meetings, Committee meetings, workgroup meetings, webinars, and calls have been held under the authority of the Commission. Activities have included but are not limited to: monitoring of coordinated reservoir operations and shortage management through the continued implementation of the 2007 Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lakes Powell and Mead (2007 Interim Guidelines); coordination on water management issues affecting the Republic of Mexico; completion and implementation of the Upper and Lower Basin Drought Contingency Plans; consideration of the

augmentation of the Colorado River supply; investigation of climate change impacts to water supply; review of annual operations plans for Glen Canyon Dam; discussions regarding curtailment avoidance; monitoring of Lees Ferry streamgage flow measurements; maintenance of Upper Basin water demand and depletion schedules; continuation of Upper Basin agricultural consumptive use studies; involvement in future water supply and demand studies; continued implementation of Upper Colorado River Basin Fund projects; and various legal matters.

Oversight and Administration of the 2007 Interim Guidelines Coordinated Operations

During the thirteenth year of operations under the 2007 Interim Guidelines, the Commission and the states of Colorado, New Mexico, Utah, and Wyoming (the Upper Division States) continued their roles and responsibilities regarding the implementation of the Guidelines. Releases from Lake Powell to the Lower Colorado River Basin are based on the relative storage volumes and related water elevation tiers of Lake Powell and Lake Mead. The years of 2015, 2016, 2017, 2018, and 2019 saw above-average releases of 9.0 million acre-feet (maf). Cumulatively, these releases amount to 3,850,000 acre-feet more than what would have been required by the Long-Range Operating Criteria (LROC) minimum objective release of 8.23 maf over the same timeframe. Despite the larger releases and substantial conservation storage amounts in Lake Mead, the elevation of Lake Mead has remained relatively flat, hovering between 1,075 – 1,090 feet over the past seven years.

Reclamation's 24-Month Study models and projects water elevations at Lakes Powell and Mead each month. These predictions are of great significance to Lake Powell's operation, with the critical August 24-Month Study run of the model determining the annual release volume for the following year. Predicting reservoir elevations with an extended horizon (e.g., both the April and August 24-Month Studies forecast elevations five months into the future) may lead to less-than-optimal operations. A review of prediction accuracy shows that Lake Powell elevations are frequently over-predicted and may result in an inaccurate tier designation. Since 2007, Commission staff and Upper Division State advisers have been working with Reclamation and the National Weather Service Colorado Basin River Forecast Center (CBRFC) to improve modeling accuracy. Modeling adjustments include the incorporation of a new method for Lake Powell inflow estimation that uses a mass balance approach, more accurate estimates of bank storage (e.g., water stored in voids in the soil cover of adjacent banks of streams and lakes), and inclusion of new hydrologic flow regimes based on reduced hydrology such as that currently experienced during the current drought of record beginning in 2000. See Table 1, for predicted and actual elevations over the 2007 Interim Guidelines implementation period.

TABLE 1. August 24-Month Study - Predicted Elevations for December End of Month (EOM)

Year	Predicted Dec. EOM Elevation (ft)	Actual Dec. EOM Elevation (ft)	Error (ft)
2007	3,596.4	3,594.6	1.8
2008	3,625.8	3,617.9	7.9
2009	3,634.8	3,626.2	8.5
2010	3,627.5	3,626.5	1.0
2011	3,646.3	3,639.3	7.0
2012	3,614.9	3,609.8	5.1
2013	3,578.3	3,584.4	-6.1
2014	3,596.6	3,597.8	-1.1
2015	3,602.5	3,600.8	1.7
2016	3,605.8	3,600.5	5.3
2017	3,627.3	3,622.9	4.5
2018	3,586.6	3,581.9	4.7
2019	3,618.6	3,608.7	9.8
2020	3,591.6	3,582.2	9.4
		Average Error	5.3

The accuracy of the 24-Month Study modeled reservoir elevations reflects the long-horizon prediction period (5 months), and the accuracy of predicted weather, precipitation, and runoff during that time. The Commission is gathering information on possible alternative approaches that will result in the optimal, sustainable coordinated management of Lakes Powell and Mead and the Colorado River System as a whole.

7.D Review

The 2007 Interim Guidelines require that, "Beginning no later than December 31, 2020, the Secretary shall initiate a formal review for purposes of evaluating the effectiveness of these Guidelines. The Secretary shall consult with the Basin States in initiating this Review" (7.D. Review). In December 2019, Secretary Bernhardt directed the Bureau of Reclamation to begin an analysis of the 2007 Interim Guidelines in 2020 to culminate in the issuance of a 7.D. Review Report in December 2020. In doing so, the Secretary noted that the analysis would be retrospective and would not imply the correctness of particular operational provisions or recommendations on future policies or actions. Throughout calendar year 2020, Reclamation engaged the Upper Division States and Commission staff on the 7.D Review, including the scope of the Review and those elements that would comprise the analysis of the "effectiveness" of the 2007 Interim Guidelines. Over the course of the 7.D. Review, the States submitted individual and collective comments on the 7.D. Review process.

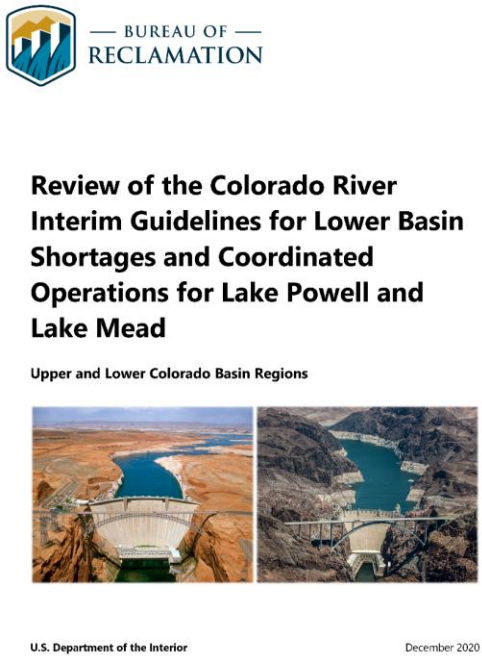


FIGURE 1. Reclamation's 7.D Review Report

Reclamation ultimately based the 7.D. Review on the adherence to seven common themes contained in the Record of Decision (ROD) for the 2007 Interim Guidelines, including the "implementation of closer coordination of operations of Lakes Powell and Mead", and the evaluation of four operational elements, including coordinated reservoir operations of Lakes Powell and Mead, "to avoid curtailment of uses in the Upper Basin, minimize shortages in the Lower Basin and not adversely affect the yield for development available in the Upper Basin." Reclamation also evaluated the effectiveness of the 2007 Interim Guidelines against the three stated purposes set forth in the ROD of improvement of Reclamation's management of the Colorado River, enhanced predictability of water delivery for mainstream Colorado River water users and creation of additional storage and delivery mechanisms for Lake Mead supply.

In December 2020, Reclamation released its 7.D. Review Report[1] documenting its

[1] U.S. Bureau of Reclamation Website. Webpage: https://www.usbr.gov/ColoradoRiverBasin/. Accessed on March 29, 2021.

operational experience under the 2007 Interim Guidelines. The Report provides a retrospective evaluation of whether operations and actions specified by the Guidelines have both adhered to the common themes and have been effective with respect to the stated purposes included in the Guidelines. The Report concludes that,

> "the Guidelines were largely effective as measured against both their purpose and common themes. [However][T]he increasing severity of the drought necessitated additional action to reduce the risk of reaching critically low elevations at Lake Powell and Lake Mead to the risk levels projected when the Guidelines were developed. This led to the adoption of the DCPs and other voluntary adaptive actions."

Upper Division States' Drought Contingency Planning

On May 20, 2019, the interstate Drought Contingency Plans (DCPs) agreements were signed and became effective for both the Upper and Lower Colorado River Basins. This followed the enactment of federal law (P.L. 116-14) authorizing the Upper and Lower Basin DCPs, which was passed by the United States Congress and signed into law by the President on April 16, 2019.

The DCPs are designed to reduce risks to the Colorado River from ongoing historic drought exacerbated by the effects of climate change. The Commission, its staff, and its legal and engineering advisers spent considerable time in Water Year 2019 finalizing the terms of the Upper Basin DCP; obtaining Commission approval of the final draft DCP agreements to which the Upper Division States are party to; supporting individual states in their efforts to obtain support (and, in some cases, legislative authority) for the DCPs; and, securing federal legislation authorizing the DCPs.

The Upper Basin DCP (consisting of the Drought Response Operations Agreement[2] and the Demand Management Storage Agreement[3]) marks the culmination of intensive efforts dating back to 2014 (December 10, 2014 Resolution[4]) by the Upper Colorado River Commission and key Commission advisers and staff, to address fluctuating water elevations and low storage conditions at Colorado River reservoirs, particularly Lakes Powell and Mead. The Upper Basin DCP is designed to: 1) protect critical elevations at Lake Powell and

[2] Upper Colorado River Commission Website. Webpage: http://www.ucrcommission.com/wp-content/uploads/2019/09/Attachment-A1-Drought-Response-Operations-Agreement-Final.pdf. Accessed on March 25, 2020.
[3] Upper Colorado River Commission Website. Webpage: http://www.ucrcommission.com/wp-content/uploads/2020/04/Attachment-A2-Demand-Managment-Storage-Agreement-Final.pdf. Accessed on March 25, 2020.
[4] Upper Colorado River Commission Website. Webpage: http://www.ucrcommission.com/wp-content/uploads/2019/09/Upper_Basin_Drought_Contingency_Plan.pdf. Accessed on March 25, 2020.

help ensure continued compliance with the 1922 Colorado River Compact; and, 2) establish the foundation for the storage of water in the Upper Basin as part of a Demand Management Program that may be developed in the future.

Two agreements comprise the Upper Basin DCP: The Drought Response Operations Agreement and the Demand Management Storage Agreement. Weather modification is also a component of the Upper Basin DCP but is subject to existing agreements and programs that predate the DCP effort. The Drought Response Operations Agreement provides for the development of a process based on proximity to a forecasted ("Target") elevation of 3,525 feet at Lake Powell to coordinate releases from the Initial Units of the Colorado River Storage Project (CRSP). This serves to protect Lake Powell from dropping to critical elevations at which time the operation of the reservoir (including hydropower generation) and the Upper Basin's obligations under the 1922 Colorado River Compact could be compromised. A Drought Response Operation would also include a recovery element so that water released from an Initial Unit(s) would be restored once an Operation is concluded. Any Drought Response Operation is expressly subject to existing environmental compliance and water and power contracts at the subject Initial Unit(s).

The Demand Management Storage Agreement permanently authorizes the storage of conserved consumptive water use volumes at Lake Powell and other CRSP Initial Units free of charge for the sole purpose of satisfying Upper Basin obligations under the 1922 Colorado River Compact. Storage of these volumes is contingent upon the development of an Upper Basin Demand Management Storage Program. The Demand Management Storage Agreement sets forth minimum conditions for establishing an Upper Basin Demand Management Program through 2026. However, the Agreement itself does not establish an Upper Basin Demand Management Program; rather, it sets forth a framework for establishing such a Program.

The Lower Division States of Arizona, California, and Nevada, together with key water users in those states, developed the Lower Basin DCP (consisting of the LB Drought Contingency Plan Agreement[5] and the LB Drought Operations Exhibit[6]) designed to contribute additional water to Lake Mead at predetermined elevations and to incentivize additional voluntary conservation of water to be stored at Lake Mead.

During 2020, the first year of DCP implementation, the Lake Mead elevation on January 1, 2020, was projected to be 1089.4 feet, which required DCP contributions by Arizona and Nevada at Lake Mead. However, because the actual

[5] Upper Colorado River Commission Website. Webpage: http://www.ucrcommission.com/wp-content/uploads/2019/09/Attachment-B-LB-DCP-Agreement-Final.pdf. Accessed March 25, 2020.
[6] Upper Colorado River Commission Website. Webpage: http://www.ucrcommission.com/wp-content/uploads/2019/09/Attachment-B-Exhibit-1-LB-Drought-Operations-1.pdf. Accessed March 25, 2020.

elevation of Lake Mead on January 1, 2020, was above 1090 feet, the contributions of both states were regarded instead as the type of intentionally created surplus (ICS) originally created.

In addition to the intra-basin DCP agreements comprising the Upper and Lower Basin DCPs, both the Upper and Lower Basin executed an agreement to "link" various aspects of the Upper and Lower Basin DCPs. This allows the Upper Basin to enforce the terms of the Lower Basin DCP against the Lower Basin signatories and the United States, and the Lower Basin to do the same as against the Upper Basin and the United States.

Since the execution of the DCPs in May 2019, the Upper Division States and Commission staff have been engaged in investigations to determine the feasibility of a Demand Management Program in the Upper Basin. While each of the four Upper Division States have intrastate processes underway to assess the potential for basin-wide Program, Commission staff have also been engaged in interstate Demand Management efforts. These include administering a substantial, multi-year grant to the Commission from Reclamation to support Upper Basin Demand Management investigations and to procure the necessary contract support to assist in these investigations. In late 2019 and early 2020, the Commission, with assistance from Upper Division State staff, solicited and reviewed proposals for contractor assistance with interstate Demand Management investigations. The Commissioners made awards and executed contracts the following summer and fall, respectively.

Negotiations with Mexico Regarding Low Elevation Reservoir Conditions and Augmentation of Supply

In 2019, the Commission and the Upper Division States were actively involved in discussions with the Department of Interior, the International Boundary and Water Commission (IBWC) and their Mexican counterparts, and representatives of the Lower Division States on additional measures for managing and sharing future shortages, as well as to meet future demands for water consistent with the terms of the 1944 United States-Mexico Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande (1944 Water Treaty), and the Upper Division States' obligations under the 1922 Colorado River Compact and 1948 Upper Colorado River Basin Compact. This binational coordination occurs through the implementation of Minute 323, an implementing agreement to the 1944 Treaty. Minute 323, signed in 2017, extends many provisions of two of its predecessor minutes, Minutes 318 and 319.

In particular, Minute 323 replaces or extends measures agreed to in Minute 319 which include conditional storage of Mexican water in the United States (Mexico's Water Reserve) and reductions based upon low elevations at Lake Mead. Minute 323 also adds measures for Binational Water Scarcity Contingency Planning conditioned upon the United States adopting similar measures in the form of a

Lower Basin drought contingency plan. In July 2019, the Principal Engineers of the Mexican and U.S. Sections of the IBWC issued a Joint Report (Joint Report) with the implementing details of the Binational Water Scarcity Contingency Plan contained in Minute 323. In August of 2019, Reclamation determined that Mexico's Binational Water Scarcity Contingency Plan would commence in 2020 due to projected Lake Mead elevations on January 1, 2020. In addition to the Binational Water Scarcity Contingency Plan, Minute 323 also includes provisions regarding:

- Distribution of surplus flows
- Distribution of flows under low elevation reservoir conditions (shortage)
- Extension of cooperative measures to address emergencies (e.g., storage during earthquake-damaged infrastructure in Mexico)
- Salinity
- Flow variability in Mexico's supply
- Environmental measures
- Investment in Projects; and,
- Measures pertaining to the All-American Canal

During 2019, various workgroups formed under Minute 323 met to undertake workgroup-designated tasks under the Minute. Commission staff participates in both the Minute 323 Environmental and Hydrology Work Groups. Moreover, Commission staff participates in the Minute 323 Oversight Group, a binational steering group that meets biannually to track the implementation of Minute 323 and to provide direction and oversight of the workgroups.

During 2020, the first year of implementation of the Binational Water Scarcity Contingency Plan, the Lake Mead elevation on January 1, 2020, was projected to be 1089.4', which required contributions (Recoverable Water Savings) at Lake Mead. However, because the actual elevation of Lake Mead on January 1, 2020, was above 1090', Mexico's Recoverable Water Savings contributions were regarded instead as deposits into Mexico's Water Reserve in accordance with the Joint Report.

Implementation of the Colorado River Basin Fund MOA

On June 29, 2020, the Second Memorandum of Agreement concerning the Upper Colorado River Basin Fund (MOA 2) was executed by the Upper Division States, the Colorado River Energy Distributors Association (CREDA), Reclamation, and the Western Area Power Administration (WAPA). MOA 2 allows the states to use, consistent with Section 5(e) of the Colorado River Storage Project Act (CRSPA) hydropower revenues deposited into the Upper Colorado River Basin Fund for qualifying state and Upper Basin-wide development projects as well as for the operation, maintenance, and replacement of existing CRSP-related projects. MOA 2 replaces the original Memorandum of Understanding of 2011 (MOA) while applying the remaining funds available under the MOA to the funds available

under MOA 2. The term of MOA 2 is from 2020 through 2037. Unless otherwise agreed, MOA 2 funds are made available to each state in accordance with the percentages set forth in Section 5(e) of the CRSPA.

Lees Ferry Streamgage and Releases from Glen Canyon Dam

The 1922 Colorado River Compact delineates the Upper and Lower Basins at Lee Ferry, Arizona, approximately sixteen miles below Glen Canyon Dam, the impoundment for Lake Powell. The nearby Lees Ferry streamgage is the closest streamflow measurement point to Lee Ferry and is therefore of great importance to the Commission. The reach between Glen Canyon Dam and the Lees Ferry streamgage is subject to gains in flow.

TABLE 2. Gain in Reach Between Glen Canyon Dam and the Lees Ferry Streamgage[7]

Water Year	Acre-Feet	Water Year	Acre-Feet
2005	129,400	2013	31,900[8]
2006	263,800	2014	87,800
2007	166,000	2015	136,100
2008	186,000	2016	117,100
2009	160,300	2017	152,300
2010	184,200	2018	157,800
2011	211,800	2019	240,100
2012	61,100	2020	194,900
		Sum	**2,480,600**

During the 2020 Water Year, the reach in question had a gain of 194,900 acre-feet. A summary of such gains over the past sixteen years are summarized in Table 2. Over the same timeframe, the cumulative gain at Lees Ferry when compared to reported Glen Canyon Dam release volumes was approximately 2,480,600 acre-feet. The Commission continues to investigate the significance of these gains when considering current and future dam operations.

Upper Colorado River Basin Consumptive Use Study

The Commission, the Upper Division States, and the Upper Colorado Region and Denver Offices of Reclamation continued their coordination of a study on how the basin might improve the speed, accuracy, support, and cost effectiveness of

[7] UCRC conducted a retrospective review of U.S. Geological Survey (USGS) data for the Lees Ferry Streamgage and Reclamation's Glen Canyon Dam releases using their National Water Information System (NWIS) and Hydrodata platforms for the 2000 – 2020 WY timeframe. These figures have been updated to reflect final and provisional data from these sources.

[8] During Water Year 2013, the U.S. Geological Survey (USGS) experienced personnel changes that resulted in an anomalously low measurement at the Lees Ferry streamgage. The actual flow volume was likely much higher.

agricultural consumptive water use estimates for the Upper Colorado River Basin. Phase I of the study identified methodologies used by states and Reclamation for measurement of agricultural consumptive water use, including suggestions for improvements. Phase II of the study evaluated methods and improvements that could be made when estimating agricultural evapotranspiration (ET) by expanding weather station networks. Phase II also evaluated the use of remote sensing methods and their feasibility for use in the Upper Colorado River Basin.

Phase III of the study commenced in 2018 and continued during 2019 and 2020. The study includes continued synthesis of information and recommendations concerning selected remote-sensing methods and a comparison of more traditional crop coefficients such as the Modified Blaney-Criddle and Penman-Monteith methods. Phase III will likely conclude the study, whereupon recommendations will be made to the Commission and Reclamation regarding the various methods for calculating agricultural consumptive water use more uniformly across the Upper Colorado River Basin.

System Conservation Pilot Program

In response to the current drought in the Colorado River Basin and declining reservoir elevations, four major water suppliers including the Central Arizona Project, Denver Water, The Metropolitan Water District of Southern California, and Southern Nevada Water Authority, together with Reclamation, contributed significant funds during calendar years 2015-2018 to assist the Colorado River Basin States in support of demand management activities in the Upper and Lower Basins. Specifically, the purpose of this funding was to support voluntary, temporary, and compensated water conservation projects to demonstrate the viability of reducing water demand in order to avoid critical low reservoir conditions.

The Commission acted as the contracting agency for administering these funds through the "System Conservation Pilot Program" in the Upper Basin (SCPP, Pilot Program), and awarded projects to conserve water. In addition to funding both projects and administrative costs, Reclamation also provided in-kind support for the Pilot Program for each of its four years in the form of a Reclamation engineer who was detailed to the Commission as the SCPP Program Manager.

There were 64 SCPP projects selected for funding from 2015 through 2018. The total project cost for the four-year Pilot Program was $8.525 million and an estimated reduction 47,425 acre-feet of consumptive water use. The vast majority of estimated conservation came from the agriculture sector. Notably, the estimated conserved consumptive use in 2018 alone (25,320 acre-feet) was greater than the estimated conservation in 2015 through 2017 combined (22,110 acre-feet).

Notwithstanding the relative success of the Pilot Program in the Upper Basin, the Commission adopted a resolution in June of 2018 to continue exploring the

feasibility of developing demand management programs while temporarily suspending the Commission's role as contracting entity for the SCPP after 2018. The Commission's action reflected its interest in focusing on outstanding considerations related to demand management identified as a consequence of administering the SCPP, especially given the role of demand management in the Upper Basin Drought Contingency Plan.

Commission Staffing and Related Issues

In March 2020, the World Health Organization declared the novel coronavirus (a.k.a., COVID-19) a global pandemic. As a result, and consistent with the guidelines imposed by the Governors of each of the Upper Division States, Commission Staff began to work remotely from home offices on March 18, 2020, and continued to telework for the remainder of water year 2020.

FIGURE 2. Commission Staff (clockwise from top left) on a "Zoom Call": Amy Haas, Sara Larsen, Teri Gomm, and Don Ostler

Notwithstanding Commission staff's physical absence from the Upper Colorado River Commission (UCRC) building in downtown Salt Lake City, in 2020, the Commission negotiated the sale of the building and the purchase of an office condominium approximately one mile from the building. The purchase and sale were consummated in December 2020. The Commission anticipates taking occupancy of the office condominium in the spring of 2021, after a renovation of the new property has been completed. The Commission has occupied the original UCRC building since 1961.

Figure 3. Lake Powell and Glen Canyon Dam - 47% capacity. (Photo by Candice Hasenyager)

Figure 4. Boulder Dam impounds the Colorado River and creates Lake Mead – 39% Capacity (Photo by Don Ostler)

Streamflow and Hydrology Summary

The historical flow of the Colorado River at Lee Ferry for Water Year 2020, based on U.S. Geological Survey (USGS) streamflow measurements at the Lees Ferry and Paria River streamgages, was 8,435,600 acre-feet. The progressive 10-year total flow at Lee Ferry was 92,509,400 acre-feet from 2011 to 2020 (for more detail, see Table 8). The natural flow of the Colorado River for Water Year 2020 was estimated to be 9.6 maf, which is less than the average natural flow of 14.6 maf for the 1896-2020 period (for more detail, see Table 7). It is also less than the average natural flows of 12.6 maf since 2000, the period of the current drought.

The Upper Colorado River Basin continues to experience extended drought. During Water Year 2020, the accumulated precipitation within the basin was approximately 77% of the most recent 30-year rolling average used by the CBRFC. Unregulated inflow to Lake Powell in Water Year 2020 was 54% of the 30-year average, or 5.85 maf. Snowpack in WY2020 was 107% of average but unfortunately resulted in less than average inflow to Lake Powell due to very dry antecedent soil moisture conditions.

Unregulated inflow to Lake Powell has varied from 2000 through 2020 as outlined, below:

Unregulated Inflow to Lake Powell
(as a Percent of recent 30-Year Average)

2000 – 62%	2007 – 68%	2014 – 96%
2001 – 59%	2008 – 102%	2015 – 94%
2002 – 25%	2009 – 88%	2016 – 89%
2003 – 51%	2010 – 73%	2017 – 110%
2004 – 49%	2011 – 139%	2018 – 43%
2005 – 105%	2012 – 45%	2019 – 120%
2006 – 73%	2013 – 47%	2020 – 54%

Unregulated inflow has been above average in only five of the last 21 years, which is the lowest 21-year period since the closure of Glen Canyon Dam in 1963. This information will be evaluated and considered during the next determination of storage volumes needed in Lake Powell to ensure that the Upper Basin is able to maintain adequate storage for a similar drought in the future without a curtailment of uses.

Summary of Reservoir Elevations and Storage

As of September 30, 2020, total system storage (Upper and Lower Basins) was 47% of capacity. Over Water Year 2020, the change in reservoir storage, excluding bank storage and evaporation, at select Upper Basin reservoirs was as follows:

- Fontenelle decreased 12,916 acre-feet
- Flaming Gorge decreased 215,229 acre-feet
- Taylor Park decreased 11,282 acre-feet
- Blue Mesa decreased 297,172 acre-feet
- Morrow Point decreased 950 acre-feet
- Crystal decreased 182 acre-feet
- Navajo decreased 238,934 acre-feet
- Lake Powell decreased 1,906,853 acre-feet

There was a combined decrease in storage in the above reservoirs of 2.68 maf (for more detail, see Table 5). Lake Powell storage decreased by 1,906,853 acre-feet and ended the water year at 47% of capacity, with 11.37 maf of storage at elevation 3,595.98 feet. The release volume from Lake Powell during Water Year 2020 was 9,001,395 acre-feet. A more detailed description of Lake Powell conditions can be found in the Summary of Reservoir Operations section of this report on page 94.

Reservoir storage in Lake Mead increased slightly during Water Year 2020 from 10.26 maf to 10.28 maf, which is 39% of Lake Mead's total storage capacity. The total Colorado River System experienced a decrease in storage during Water Year 2020 of approximately 2,759,000 acre-feet and ended the year at 48% of capacity.

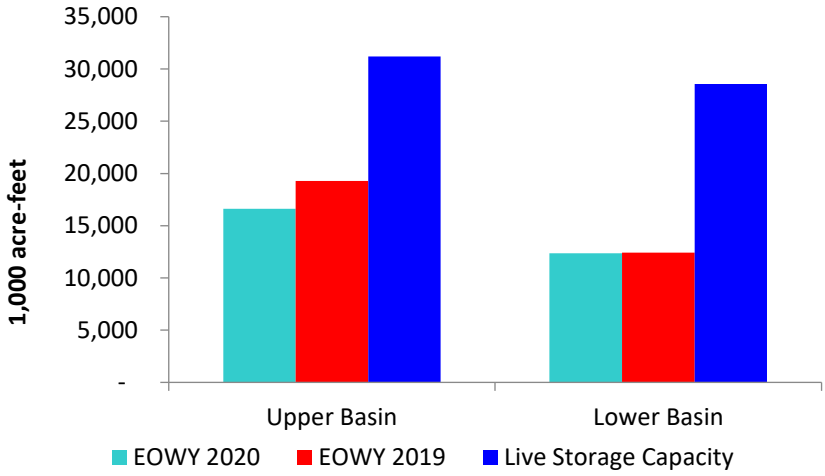


Table 3 on page 29 shows the statistical data for principal reservoirs in the Upper Colorado River Basin. Table 4 on page 30 shows the same for Lower Colorado River Basin reservoirs.

Graphs of the elevations and storage amounts related to the implementation of the LROC and the 2007 Interim Guidelines for Lake Powell, Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs in the Upper Colorado River Basin and Lake Mead in the Lower Basin are shown on pages 31 through 38 for Water Year 2020.

TABLE 3

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS

IN THE COLORADO RIVER UPPER BASIN

Colorado River Storage Project (CRSP) Units

(Total Surface Capacity)

Units: Elevation = feet; Capacity = 1,000 acre-feet

	Fontenelle		Flaming Gorge		Taylor Park		Blue Mesa		Morrow Point		Crystal		Navajo		Lake Powell	
	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity
River Elev. at the Dam (Ave. Tailwater)	-	-	5,603	-	9,174	-	7,160	-	6,775	-	6,534	-	5,720	-	3,138	-
Dead Storage	6,408	0.56	5,740	40	-	-	7,358	111	6,808	-	6,670	8	5,775	13	3,370	1,893
Inactive Storage (Min. Power Pool)	-	-	5,871	273	-	-	7,393	192	7,100	75	6,700	12	5,990	673	3,490	5,890
Rated Head	6,491	234	5,946	1,102	-	-	7,438	361	7,108	80	6,740	20	-	-	3,570	11,000
Maximum Storage	6,506	345	6,040	3,789	9,330	106	7,519	941	7,160	117	6,755	25	6,085	1,709	3,700	26,215

TABLE 4

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS

IN THE COLORADO RIVER LOWER BASIN

(Usable Surface Capacity)

Units: Elevation = feet; Capacity = 1,000 acre-feet

	Lake Mead		Lake Mohave		Lake Havasu	
	Elevation	Capacity	Elevation	Capacity	Elevation	Capacity
River Elev. at the Dam (Ave. Tailwater)	646	(2,378)	506	(8.5)	370	(28.6)
Dead Storage	895	-	533.4	-	400	-
Inactive Storage (Min. Power Pool)	1,050	7,471	570	217.5	440	439.5
Rated Head	1,122.8	13,633				
Maximum Storage	1,221.4	26,159	647	1,809.8	450	619.4

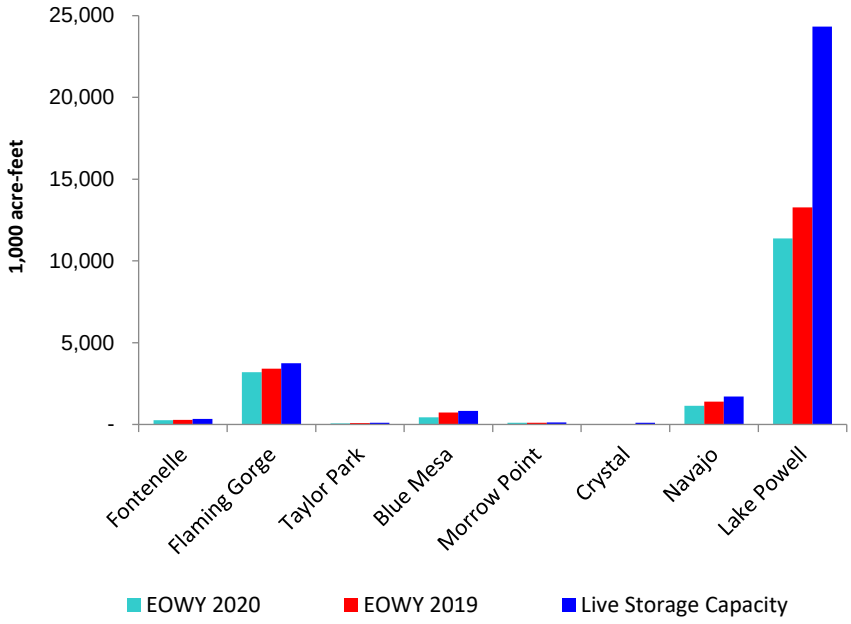
TABLE 5

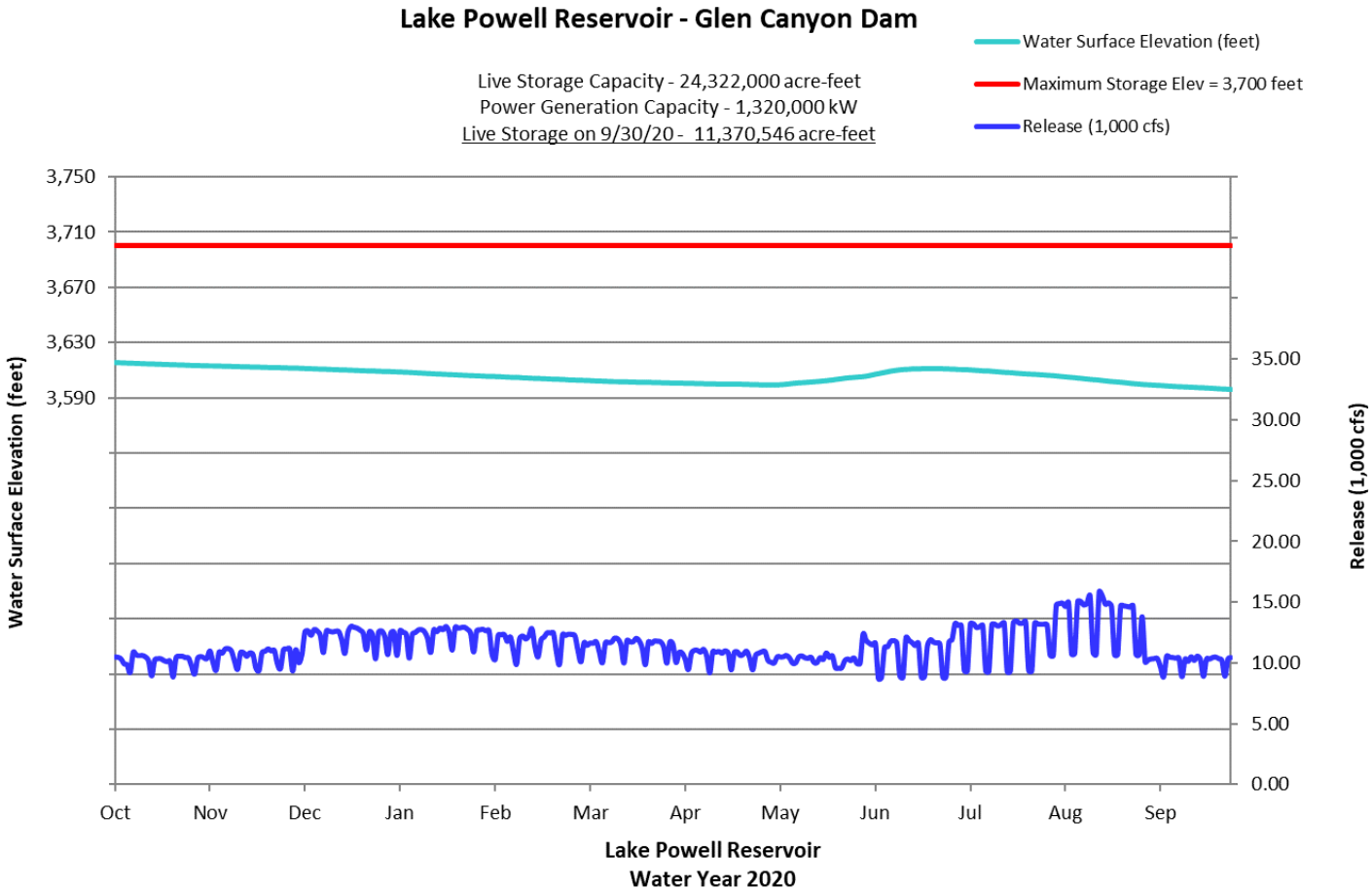
STORAGE IN PRINCIPAL RESERVOIRS OF THE UPPER BASIN

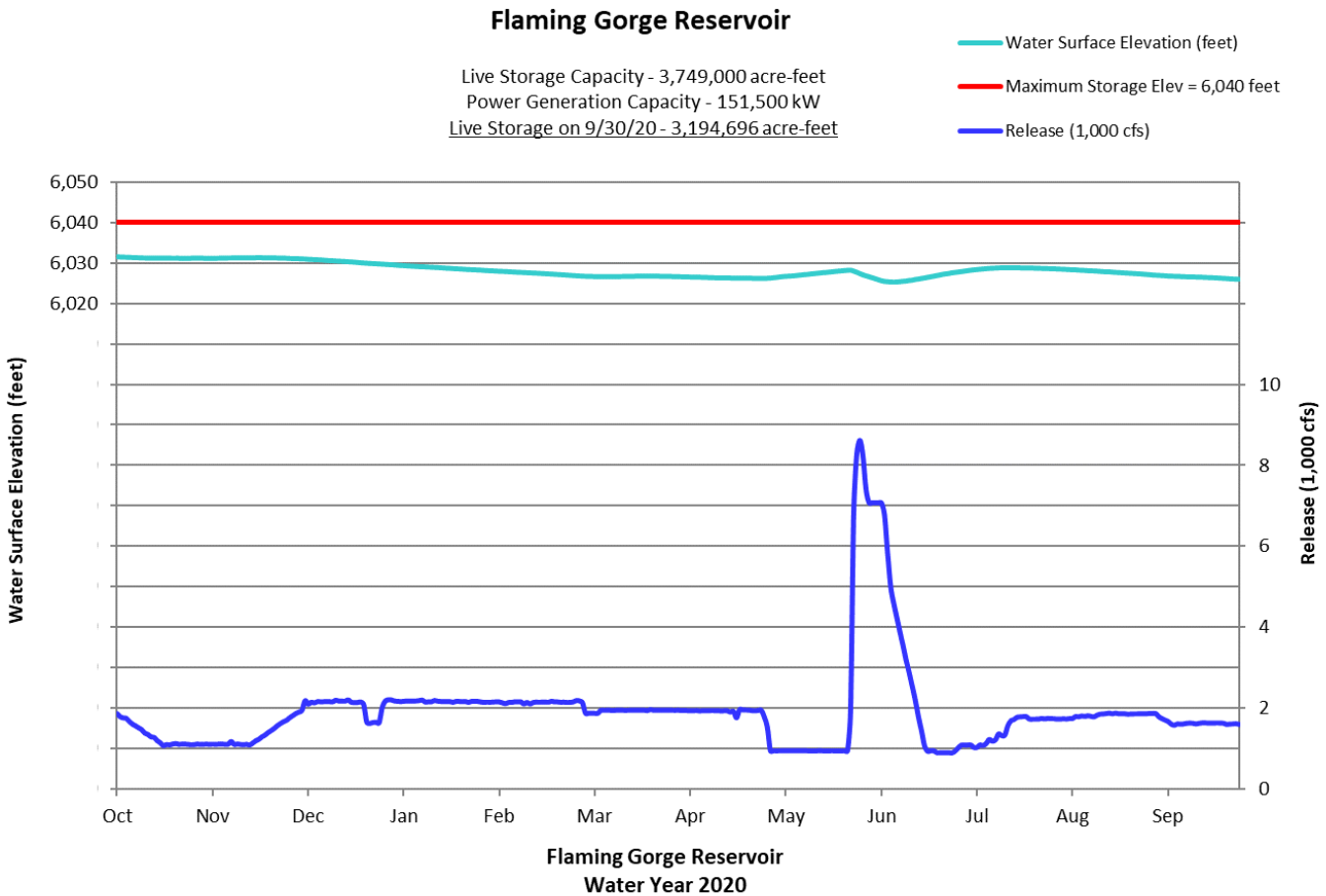
END OF WATER YEAR 2020

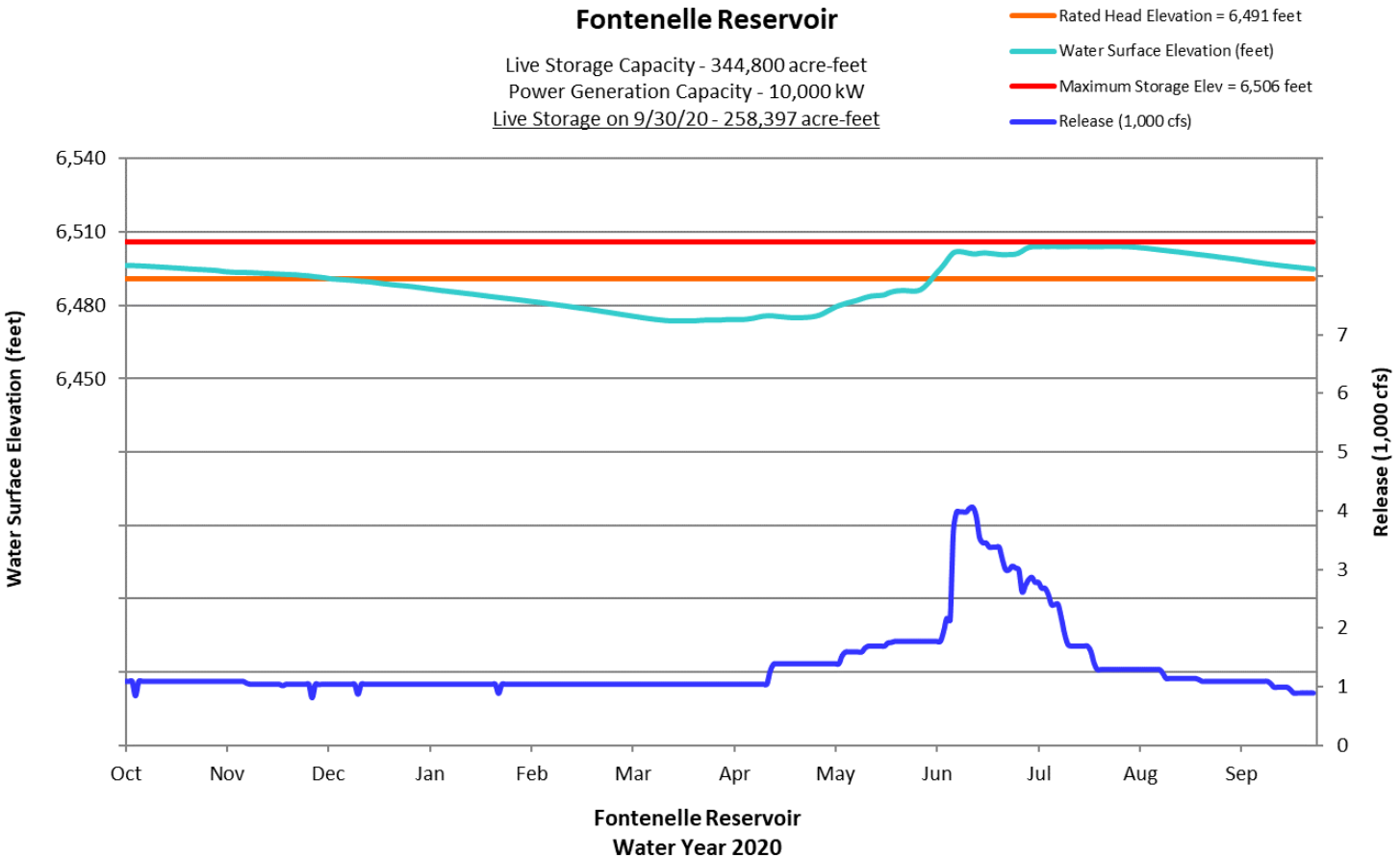
LIVE STORAGE CONTENTS

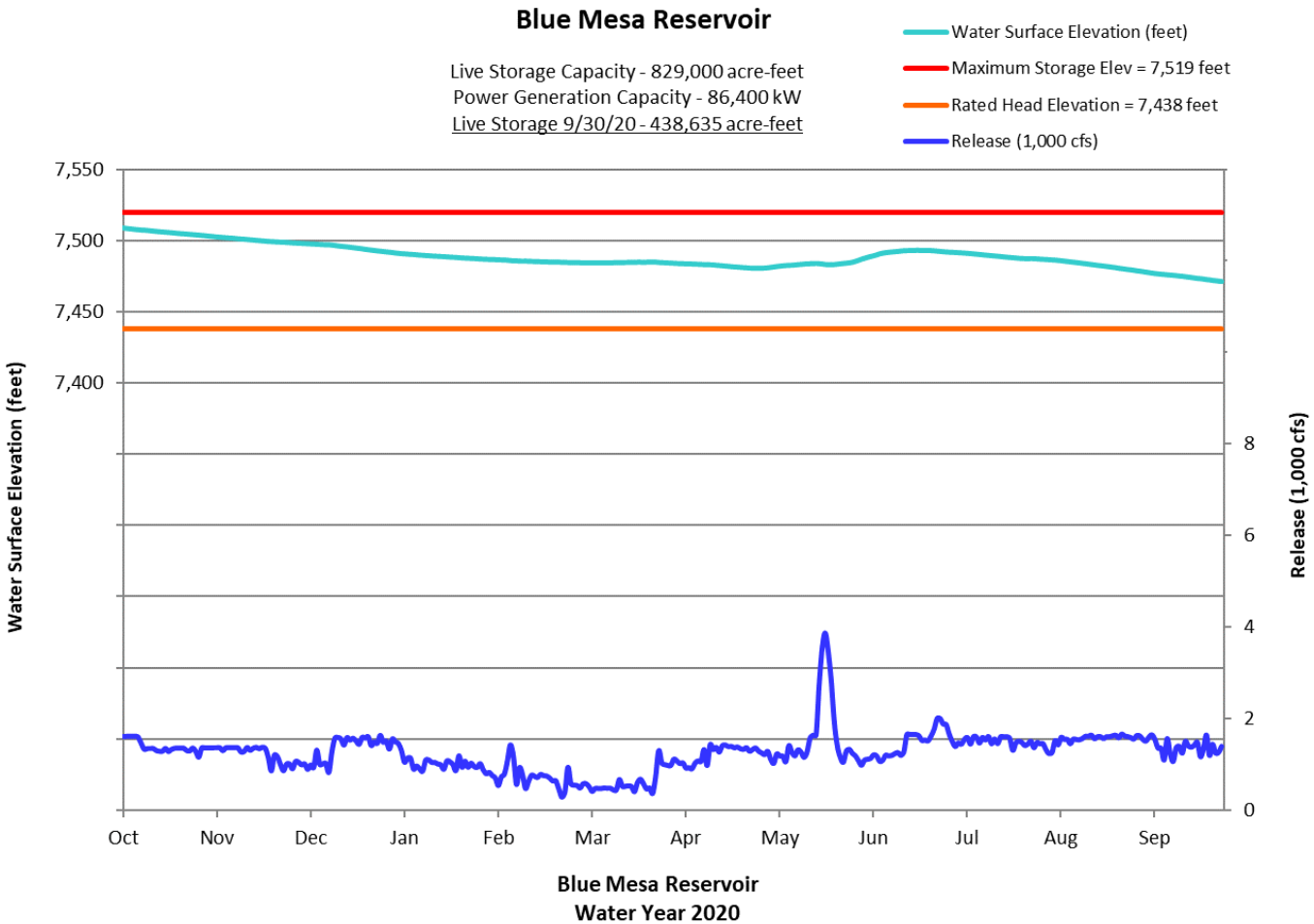
	Sept 30, 2020 (acre-feet)	Percent Live Capacity	Sept 30, 2019 (acre-feet)	Percent Live Capacity	Change in Storage (acre-feet)
Fontenelle	258,397	74.9%	271,313	78.7%	(12,916)
Flaming Gorge	3,194,696	85.2%	3,409,995	91.0%	(215,299)
Taylor Park	69,293	65.2%	80,575	75.8%	(11,282)
Blue Mesa	438,635	52.9%	735,807	88.8%	(297,172)
Morrow Point	108,974	93.1%	109,924	93.9%	(950)
Crystal	16,079	91.7%	16,261	92.7%	(182)
Navajo	1,149,180	67.5%	1,388,114	81.6%	(238,934)
Lake Powell	11,370,546	46.8%	13,277,399	54.6%	(1,906,853)
Total	**16,605,800**	**53.2%**	**19,289,388**	**61.9%**	**(2,683,588)**




Lake Powell Reservoir - Glen Canyon Dam
Live Storage Capacity - 24,322,000 acre-feet
Power Generation Capacity - 1,320,000 kW
Live Storage on 9/30/20 - 11,370,546 acre-feet
Water Surface Elevation (feet)
Maximum Storage Elev = 3,700 feet
Release (1,000 cfs)
3,750
3,710
3,670
3,630
3,590
Water Surface Elevation (feet)
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Release (1,000 cfs)
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Lake Powell Reservoir
Water Year 2020


Flaming Gorge Reservoir
Live Storage Capacity - 3,749,000 acre-feet
Power Generation Capacity - 151,500 kW
Live Storage on 9/30/20 - 3,194,696 acre-feet
Water Surface Elevation (feet)
Maximum Storage Elev = 6,040 feet
Release (1,000 cfs)
6,050
6,040
6,030
6,020
Water Surface Elevation (feet)
10
8
6
4
2
0
Release (1,000 cfs)
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Flaming Gorge Reservoir
Water Year 2020


Fontenelle Reservoir
Live Storage Capacity - 344,800 acre-feet
Power Generation Capacity - 10,000 kW
Live Storage on 9/30/20 - 258,397 acre-feet
Rated Head Elevation = 6,491 feet
Water Surface Elevation (feet)
Maximum Storage Elev = 6,506 feet
Release (1,000 cfs)
6,540
6,510
6,480
6,450
Water Surface Elevation (feet)
Release (1,000 cfs)
0
1
2
3
4
5
6
7
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Fontenelle Reservoir
Water Year 2020


Blue Mesa Reservoir
Live Storage Capacity - 829,000 acre-feet
Power Generation Capacity - 86,400 kW
Live Storage 9/30/20 - 438,635 acre-feet
Water Surface Elevation (feet)
Maximum Storage Elev = 7,519 feet
Rated Head Elevation = 7,438 feet
Release (1,000 cfs)
7,550
7,500
7,450
7,400
Water Surface Elevation (feet)
8
6
4
2
0
Release (1,000 cfs)
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Blue Mesa Reservoir
Water Year 2020

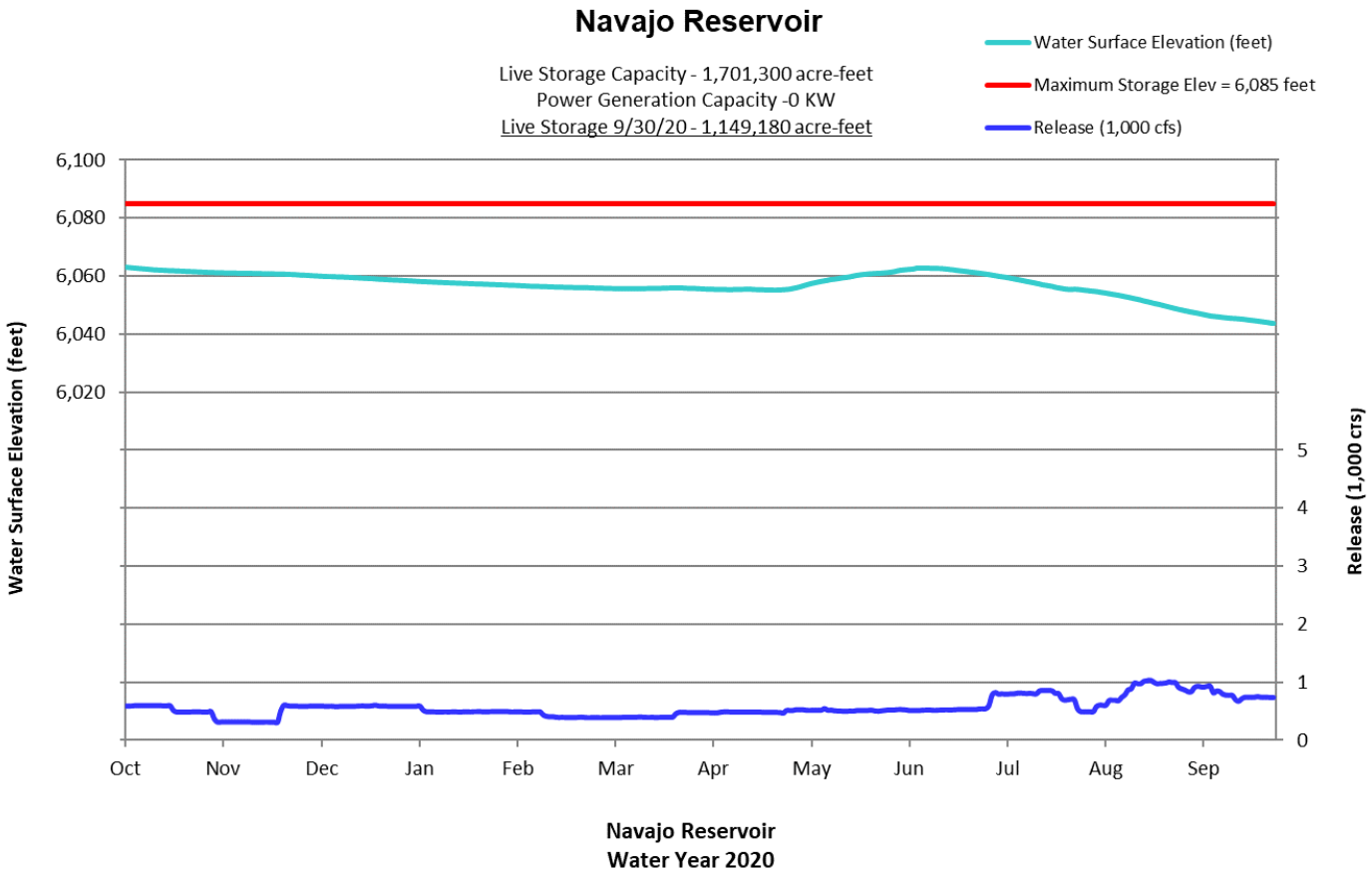

Navajo Reservoir
Live Storage Capacity - 1,701,300 acre-feet
Power Generation Capacity -0 KW
Live Storage 9/30/20 - 1,149,180 acre-feet
Water Surface Elevation (feet)
Maximum Storage Elev = 6,085 feet
Release (1,000 cfs)
6,100
6,080
6,060
6,040
6,020
Water Surface Elevation (feet)
5
4
3
2
1
0
Release (1,000 cfs)
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Navajo Reservoir
Water Year 2020

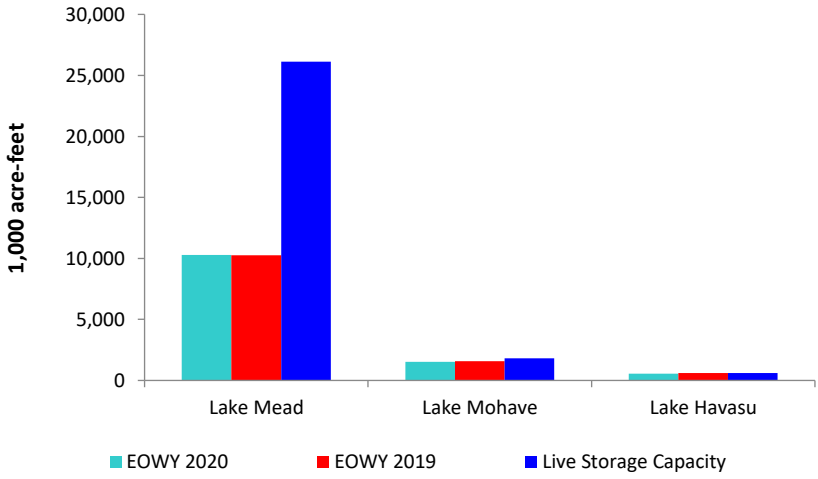
TABLE 6

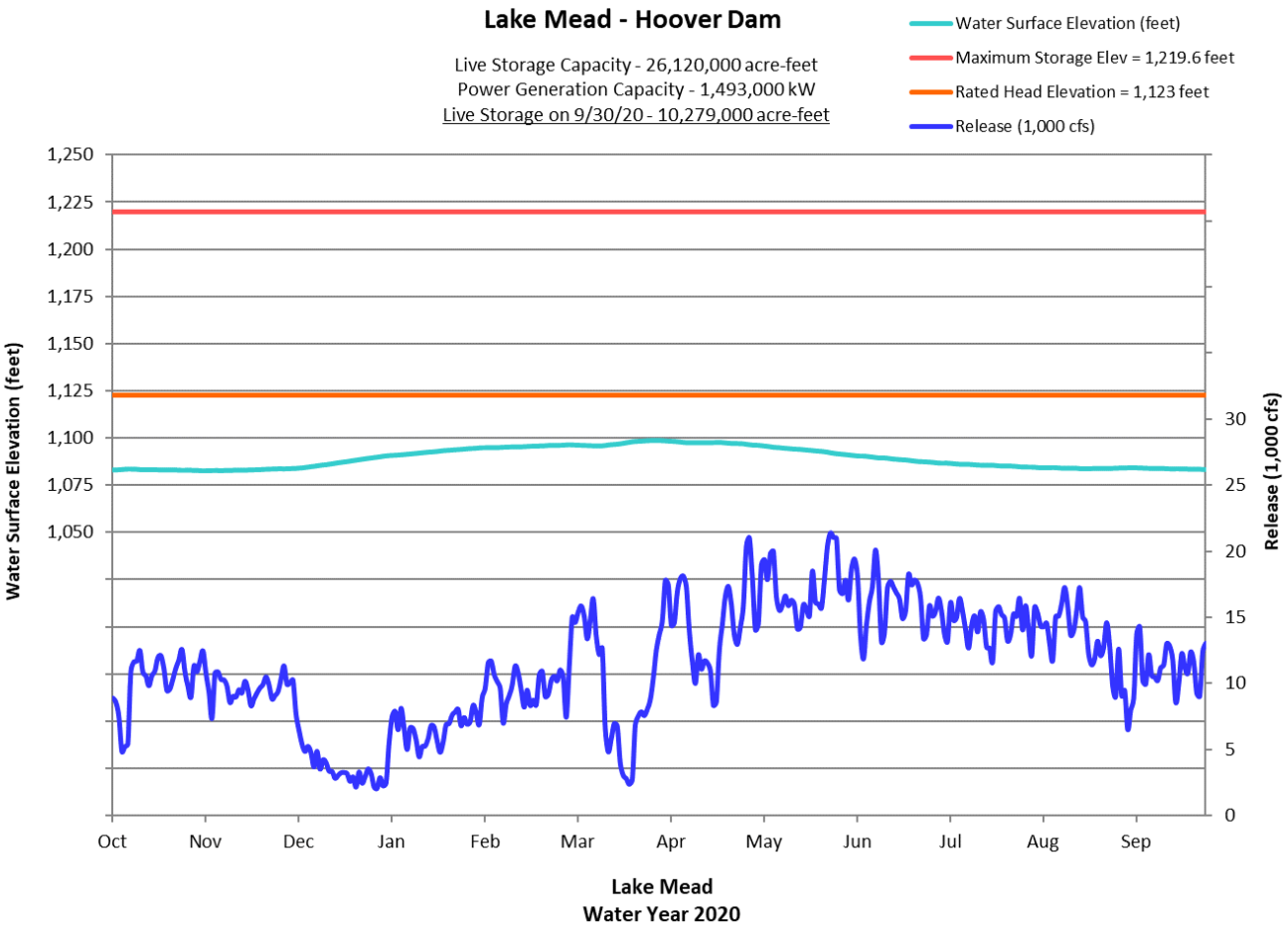
STORAGE IN PRINCIPAL RESERVOIRS OF THE LOWER BASIN

END OF WATER YEAR 2020

LIVE STORAGE CONTENTS

	September 30, 2020 (acre-feet)	Percent Live Capacity	September 30, 2019 (acre-feet)	Percent Live Capacity	Change in Storage (acre-feet)
Lake Mead	10,279,000	39.4%	10,261,000	39.3%	18,000
Lake Mohave	1,524,800	84.3%	1,573,500	87.0%	(48,700)
Lake Havasu	553,900	89.5%	599,900	96.9%	(46,000)
Total	**12,357,700**	**43.3%**	**12,434,400**	**43.6%**	**(76,700)**




Lake Mead - Hoover Dam
Live Storage Capacity - 26,120,000 acre-feet
Power Generation Capacity - 1,493,000 kW
Live Storage on 9/30/20 - 10,279,000 acre-feet
Water Surface Elevation (feet)
Maximum Storage Elev = 1,219.6 feet
Rated Head Elevation = 1,123 feet
Release (1,000 cfs)
Water Surface Elevation (feet)
1,250
1,225
1,200
1,175
1,150
1,125
1,100
1,075
1,050
Release (1,000 cfs)
30
25
20
15
10
5
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Lake Mead
Water Year 2020

Flows of the Colorado River

Table 7 on pages 42 through 45 shows the estimated natural flow of the Colorado River at Lee Ferry, Arizona for each water year from 1896 through 2020. Column (4) of the table shows the average natural flow for any given year within the period computed through water year 2020. Column (5) shows the average natural flow for a given year within the period computed since 1896. Column (6) shows the average natural flow for each progressive ten-year period beginning with the ten-year period ending on September 30, 1905. The difference between the natural flow for a given year and the average flow over the 124-year period, 1896 through 2020, is shown in column (7).

Article III(d) of the 1922 Colorado River Compact stipulates that "the States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in a continuing progressive series beginning with the first day of October next succeeding the ratification of this Compact." Prior to the storage of water in CRSP reservoirs, which began in 1962, the flow of the river at Lee Ferry in any ten consecutive years was greatly in excess of the 75,000,000 acre-feet required by the Compact. Beginning in 1962, CRSP reservoirs have regulated the river above Glen Canyon Dam.

It should be noted that for this annual report, UCRC conducted a retrospective review of U.S. Geological Survey (USGS) data for the Lees Ferry Streamgage and Reclamation's Glen Canyon Dam releases using their National Water Information System (NWIS) and Hydrodata platforms for the 2000 – 2020 WY timeframe. This table and all following have been updated to reflect final and provisional data from these sources.

Table 8 on page 46, shows the historic flow at Lee Ferry for the period 1954 through 2020 and the historic flow for each progressive ten-year period from 1954 through 2020, beginning with the ten-year period ending September 30, 1962, the commencement of storage in CRSP reservoirs.

The flow at Lee Ferry during the ten-year period ending on September 30, 2020, was 92,509,400 acre-feet. The graphs on pages 47 and 48 illustrate some of the pertinent historical flows through the Colorado River System above Lee Ferry. The first graph on page 47 is entitled "Colorado River Natural and Historic Flow Volumes at Lee Ferry, Arizona (to Water Year 2020)." The top of each red vertical bar represents the estimated natural flow of the river, i.e., the flow of the river in millions of acre-feet past Lee Ferry for a given year had it not been depleted by human activities. The lower black bars represent the estimated or measured historic flow at Lee Ferry, and the difference between the two sections of the bar in any given year shows the stream depletion, or the amount of water estimated to have been removed by human activity from the natural supply upstream from

Lee Ferry.

Of note, in 1977 and again in 1981, the historic flow at Lee Ferry exceeded the natural flow. Beginning in 1962, part of this depletion at Lee Ferry was caused by the retention and storage of water in storage units of the CRSP. The horizontal line (at 14.6 maf) is the estimated long-term average natural flow from 1896 through 2020. As the 1922 Colorado River Compact is administered based on running averages over ten-year periods, the progressive ten-year average historic and natural flows are displayed on this graph.

The second graph on page 48, entitled "Lee Ferry Average Annual Natural and Historic Flow for Selected Periods," illustrates the historic measured flow at Lee Ferry and natural flow averages for several selected periods of record. The periods selected are those referenced most often for various purposes related to Colorado River System operations.

On page 48, from the bottom bars to the top.

1) For the longest period shown, 1896-2020, the estimated average annual natural flow is 14.6 maf, and the average annual historic measured flow is 11.6 maf.
2) For the period 1896-1921, prior to the 1922 Colorado River Compact, the estimated average annual natural flow was 16.8 maf, which is considerably greater than for any other period selected, including the long-term average. A streamgage station at Lee Ferry, Arizona was not installed until 1921. The natural flow at Lee Ferry prior to the 1922 Compact was estimated based on records obtained at other stations (e.g., the streamgage on the Colorado River at Yuma, Arizona for the period 1902-1921).
3) For the second longest period shown, 1906-2020, the estimated average annual natural flow is 14.7 maf, and the average annual historic measured flow is 11.5 maf. Many of the early records for this series of years as well as for the 1896-2020 period are based on estimates of flows made at other streamgage stations, as mentioned in (2) above. This average is about equal to the 15 maf estimated for the 1906-1967 period, which was used as the basis for justification of a water supply for the Central Arizona Project authorized in 1968.
4) The estimated average annual natural flow during the 1914-2020 periods is 14.4 maf. This period is an extension of the 1914-1965 period used in the Upper Colorado Region Comprehensive Framework studies of 1971. The average annual natural flow for the 1914-1965 periods is 14.6 maf.
5) The average annual natural flow for the period 1914-1945 is 15.6 maf. This was the period of record used by the negotiators of the Upper Colorado River Basin Compact.
6) For the period 1922-2020, which is the period of record since the signing of the Colorado River Compact, the average annual natural flow is 14.0

maf, and the average annual historic measured flow is 10.6 maf. Records for this series of years are based upon actual measurements of flows at the Lees Ferry streamgage. The ten-year progressive moving average flow since 1922 is considerably less than the ten-year progressive moving average flow prior to 1922.

7) The 1931-2018 or "early pluvial removed" period of record is currently used for hydrologic modeling purposes by Reclamation. It excludes a period of unusual wetness prevalent in the pre-1931 period.
8) Two completely unrelated ten-year periods of minimum flows have occurred since 1930. During these periods, 1931-1940 and 1954-1963, the average annual natural flow amounts to only 11.8 maf and 11.6 maf, respectively.
9) For a 12-year period, 1953-1964, the average annual natural flow amounted to only 11.6 maf.
10) Since Glen Canyon Dam's closure in 1963, the estimated natural flow for the subsequent 50 years is 14.2 maf. The estimated historical measured flow for the same period (1964-2020) is 9.7 maf.
11) The 1988-2018 period, or "stress test hydrology" period of record, is currently used by Reclamation for hydrologic modeling purposes and was used during the development of the DCPs to evaluate relative risk of various operational scenarios. It comprises a period of more extreme dryness that may represent changing hydrology due to climate change.
12) The estimated average annual natural flow and historic measured flow amounts recorded for 2000-2020 period of record are used as the extent years of the most recent extended drought and further illustrate the trend within the Upper Basin of reduced hydrologic flows.

TABLE 7

ESTIMATED NATURAL FLOW VOLUMES AT LEE FERRY

(million acre-feet)

1	2	3	4	5	6	7
Years to 2020	**End of Water Year**	**Estimated Natural Flow**	**Average to 2020**	**Average Since 1896**	**Progressive 10-Year Average**	**Natural Flow Minus 125-Year Average**
125	1896	10.1	14.6	10.1		-4.5
124	1897	18.0	14.6	14.1		3.4
123	1898	13.8	14.6	14.0		-0.8
122	1899	15.9	14.6	14.5		1.3
121	1900	13.2	14.6	14.2		-1.4
120	1901	13.6	14.6	14.1		-1.0
119	1902	9.4	14.6	13.4		-5.2
118	1903	14.8	14.7	13.6		0.2
117	1904	15.6	14.7	13.8		1.0
116	1905	16.0	14.7	14.0	14.0	1.4
115	1906	19.1	14.6	14.5	14.9	4.5
114	1907	23.4	14.6	15.2	15.5	8.8
113	1908	12.9	14.5	15.1	15.4	-1.7
112	1909	23.3	14.5	15.7	16.1	8.7
111	1910	14.2	14.5	15.6	16.2	-0.4
110	1911	16.0	14.5	15.6	16.5	1.4
109	1912	20.5	14.4	15.9	17.6	5.9
108	1913	14.5	14.4	15.8	17.6	-0.1
107	1914	21.2	14.4	16.1	18.1	6.6
106	1915	14.0	14.3	16.0	17.9	-0.6
105	1916	19.2	14.3	16.1	17.9	4.6
104	1917	24.0	14.3	16.5	18.0	9.4
103	1918	15.4	14.2	16.4	18.2	0.8
102	1919	12.5	14.2	16.3	17.2	-2.1
101	1920	22.0	14.2	16.5	17.9	7.4
100	1921	23.0	14.1	16.8	18.6	8.4
99	1922	18.3	14.0	16.8	18.4	3.7
98	1923	18.3	14.0	16.9	18.8	3.7
97	1924	14.2	13.9	16.8	18.1	-0.4
96	1925	13.0	13.9	16.6	18.0	-1.6
95	1926	15.9	13.9	16.6	17.7	1.3
94	1927	18.6	13.9	16.7	17.1	4.0
93	1928	17.3	13.9	16.7	17.3	2.7
92	1929	21.4	13.8	16.8	18.2	6.8
91	1930	14.9	13.8	16.8	17.5	0.3
90	1931	7.8	13.7	16.5	16.0	-6.8
89	1932	17.2	13.8	16.6	15.9	2.6
88	1933	11.4	13.8	16.4	15.2	-3.2
87	1934	5.6	13.8	16.1	14.3	-9.0

1	2	3	4	5	6	7
Years to 2020	End of Water Year	Estimated Natural Flow	Average to 2020	Average Since 1896	Progressive 10-Year Average	Natural Flow Minus 125-Year Average
86	1935	11.6	13.9	16.0	14.2	-3.0
85	1936	13.8	13.9	16.0	14.0	-0.8
84	1937	13.7	13.9	15.9	13.5	-0.9
83	1938	17.5	13.9	16.0	13.5	2.9
82	1939	11.1	13.9	15.8	12.5	-3.5
81	1940	8.6	13.9	15.7	11.8	-6.0
80	1941	18.1	14.0	15.7	12.9	3.5
79	1942	19.1	13.9	15.8	13.1	4.5
78	1943	13.1	13.9	15.8	13.2	-1.5
77	1944	15.2	13.9	15.7	14.2	0.6
76	1945	13.4	13.9	15.7	14.4	-1.2
75	1946	10.4	13.9	15.6	14.0	-4.2
74	1947	15.5	13.9	15.6	14.2	0.9
73	1948	15.6	13.9	15.6	14.0	1.0
72	1949	16.4	13.9	15.6	14.5	1.8
71	1950	12.9	13.8	15.6	15.0	-1.7
70	1951	11.6	13.8	15.5	14.3	-3.0
69	1952	20.7	13.9	15.6	14.5	6.1
68	1953	10.6	13.8	15.5	14.2	-4.0
67	1954	7.7	13.8	15.4	13.5	-6.9
66	1955	9.2	13.9	15.3	13.1	-5.4
65	1956	10.7	14.0	15.2	13.1	-3.9
64	1957	20.1	14.0	15.3	13.6	5.5
63	1958	16.5	13.9	15.3	13.6	1.9
62	1959	8.6	13.9	15.2	12.9	-6.0
61	1960	11.3	14.0	15.1	12.7	-3.3
60	1961	8.5	14.0	15.0	12.4	-6.1
59	1962	17.3	14.1	15.0	12.1	2.7
58	1963	8.4	14.1	15.0	11.8	-6.2
57	1964	10.2	14.2	14.9	12.1	-4.4
56	1965	18.9	14.2	14.9	13.1	4.3
55	1966	11.2	14.1	14.9	13.1	-3.4
54	1967	11.9	14.2	14.8	12.3	-2.7
53	1968	13.7	14.2	14.8	12.0	-0.9
52	1969	14.4	14.3	14.8	12.6	-0.2
51	1970	15.4	14.3	14.8	13.0	0.8
50	1971	15.1	14.2	14.8	13.7	0.5
49	1972	12.2	14.2	14.8	13.1	-2.4
48	1973	19.4	14.3	14.9	14.2	4.8
47	1974	13.3	14.1	14.8	14.6	-1.3
46	1975	16.6	14.2	14.9	14.3	2.0

1	2	3	4	5	6	7
Years to 2020	End of Water Year	Estimated Natural Flow	Average to 2020	Average Since 1896	Progressive 10-Year Average	Natural Flow Minus 125-Year Average
45	1976	11.6	14.1	14.8	14.4	-3.0
44	1977	5.8	14.2	14.7	13.8	-8.8
43	1978	15.2	14.4	14.7	13.9	0.6
42	1979	17.9	14.3	14.8	14.3	3.3
41	1980	17.5	14.3	14.8	14.5	2.9
40	1981	8.2	14.2	14.7	13.8	-6.4
39	1982	16.2	14.3	14.7	14.2	1.6
38	1983	24.0	14.3	14.8	14.6	9.4
37	1984	24.5	14.0	14.9	15.8	9.9
36	1985	20.8	13.7	15.0	16.2	6.2
35	1986	21.9	13.5	15.1	17.2	7.3
34	1987	16.9	13.3	15.1	18.3	2.3
33	1988	11.5	13.2	15.1	17.9	-3.1
32	1989	9.4	13.2	15.0	17.1	-5.2
31	1990	8.6	13.3	14.9	16.2	-6.0
30	1991	12.3	13.5	14.9	16.6	-2.3
29	1992	11.0	13.5	14.9	16.1	-3.6
28	1993	18.5	13.6	14.9	15.5	3.9
27	1994	10.4	13.5	14.9	14.1	-4.2
26	1995	19.7	13.6	14.9	14.0	5.1
25	1996	13.8	13.3	14.9	13.2	-0.8
24	1997	21.0	13.3	15.0	13.6	6.4
23	1998	16.8	13.0	15.0	14.2	2.2
22	1999	16.1	12.8	15.0	14.8	1.5
21	2000	10.3	12.6	14.9	15.0	-4.3
20	2001	10.9	12.8	14.9	14.9	-3.7
19	2002	5.5	12.9	14.8	14.3	-9.1
18	2003	10.5	13.3	14.8	13.5	-4.1
17	2004	9.1	13.4	14.7	13.4	-5.5
16	2005	17.0	13.7	14.7	13.1	2.4
15	2006	13.1	13.5	14.7	13.0	-1.5
14	2007	12.5	13.5	14.7	12.2	-2.1
13	2008	16.4	13.6	14.7	12.1	1.8
12	2009	14.3	13.3	14.7	12.0	-0.3
11	2010	12.9	13.3	14.7	12.2	-1.7
10	2011	20.4	13.3	14.8	13.2	5.8
9	2012	8.1	12.5	14.7	13.4	-6.5
8	2013	9.1	13.0	14.6	13.3	-5.5
7	2014	14.8	13.6	14.7	13.9	0.2
6	2015	14.2	13.4	14.6	13.6	-0.4
5	2016	14.0	13.3	14.6	13.7	-0.6

1	2	3	4	5	6	7
Years to 2020	**End of Water Year**	**Estimated Natural Flow**	**Average to 2020**	**Average Since 1896**	**Progressive 10-Year Average**	**Natural Flow Minus 125-Year Average**
4	2017	16.6	13.1	14.7	14.1	2.0
3	2018	8.0	11.9	14.6	13.2	-6.6
2	2019	18.0	13.8	14.6	13.6	3.4
1	**2020**	**9.6**	**9.6**	**14.6**	**13.3**	**-5.0**
Maximum	24.5				18.8	9.9
Minimum	5.5				11.8	-9.1
Average	14.6				14.7	0.0

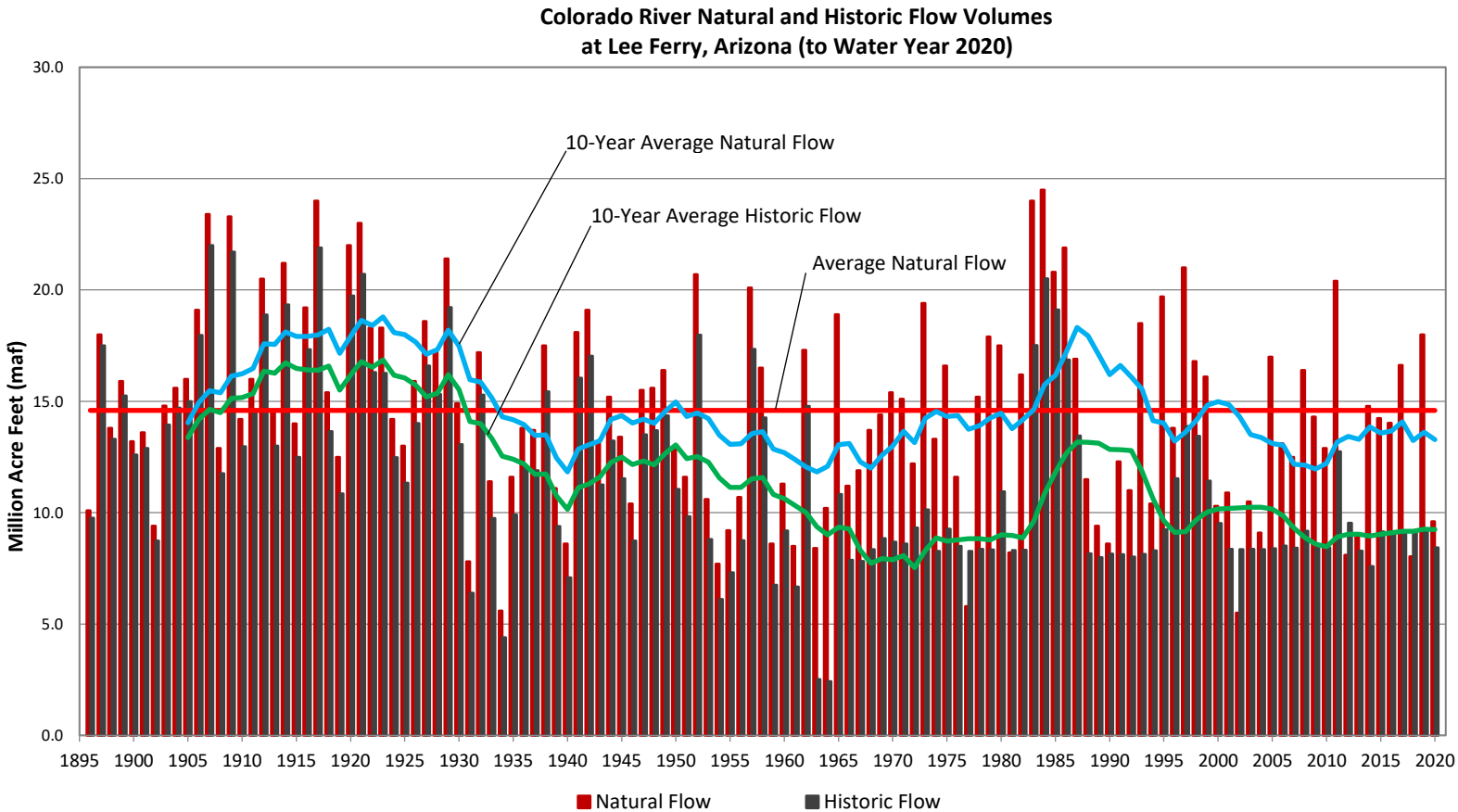
TABLE 8

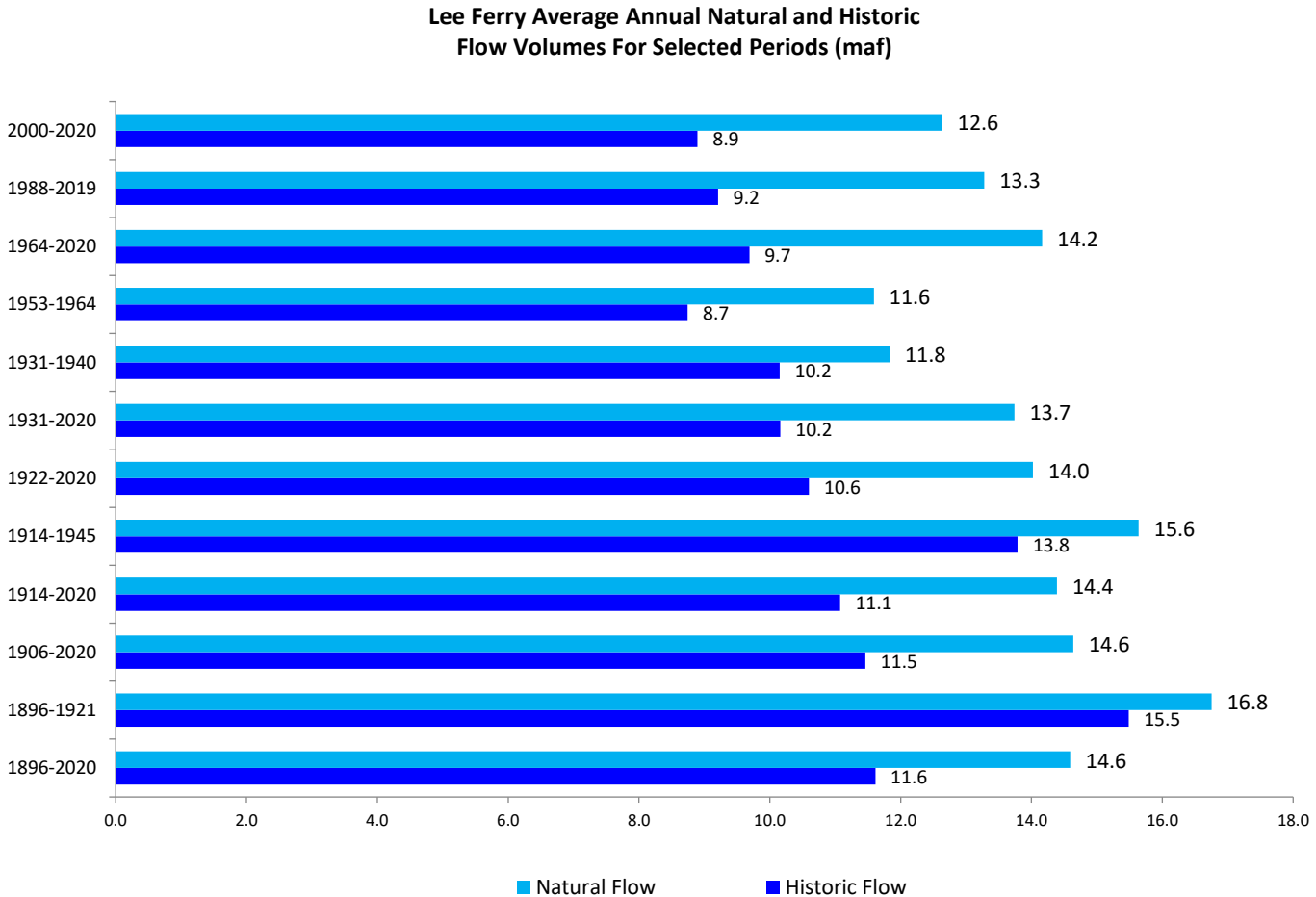
HISTORIC FLOW AT LEE FERRY

1954 - 2020

End of Water Year	Historic Flow at Lee Ferry (maf)	10-Year Progressive Flow at Lee Ferry (kaf)	End of Water Year	Historic Flow at Lee Ferry (maf)	10-Year Progressive Flow at Lee Ferry (kaf)
1954	6.116	115,636	1988	8.160	131,545
1955	7.307	111,403	1989	7.994	131,205
1956	8.750	111,409	1990	8.151	128,406
1957	17.340	115,239	1991	8.131	128,221
1958	14.260	115,809	1992	8.023	127,921
1959	6.756	108,205	1993	8.137	118,537
1960	9.192	106,337	1994	8.304	106,324
1961	6.674	103,180	1995	9.242	96,457
1962	14.790	99,990	1996	11.532	91,123
1963	2.520	93,705	1997	13.874	91,547
1964	2.427	90,016	1998	13.440	96,827
1965	10.835	93,544	1999	11.430	100,264
1966	7.870	92,664	2000	9.529	101,642
1967	7.824	83,148	2001	8.361	101,872
1968	8.358	77,246	2002	8.347	102,197
1969	8.850	79,340	2003	8.372	102,432
1970	8.688	78,836	2004	8.348	102,475
1971	8.607	80,769	2005	8.395	101,628
1972	9.330	75,309	2006	8.507	98,603
1973	10.141	82,930	2007	8.421	93,150
1974	8.277	88,780	2008	9.180	88,890
1975	9.274	87,219	2009	8.406	85,866
1976	8.494	87,843	2010	8.437	84,774
1977	8.269	88,288	2011	12.753	89,166
1978	8.369	88,299	2012	9.542	90,361
1979	8.333	87,782	2013	8.289	90,277
1980	10.950	90,044	2014	7.590	89,519
1981	8.316	89,753	2015	9.157	90,282
1982	8.323	88,746	2016	9.138	90,913
1983	17.520	96,125	2017	9.170	91,661
1984	20.518	108,366	2018	9.171	91,653
1985	19.109	118,201	2019	9.264	92,511
1986	16.866	126,573	**2020**	**8.436**	**92,509**
1987	13.450	131,754			

Table Note: Storage in Flaming Gorge and Navajo Reservoirs began in 1962. Storage in Lake Powell began in 1963. Storage in Fontanelle Reservoir began in 1964. Data have been updated using the NWIS and Hydrodata platform for the 2000-2020 WY period.


Colorado River Natural and Historic Flow Volumes
at Lee Ferry, Arizona (to Water Year 2020)
Million Acre Feet (maf)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
10-Year Average Natural Flow
10-Year Average Historic Flow
Average Natural Flow
Natural Flow
Historic Flow


Lee Ferry Average Annual Natural and Historic Flow Volumes For Selected Periods (maf)
2000-2020
12.6
8.9
1988-2019
13.3
9.2
1964-2020
14.2
9.7
1953-1964
11.6
8.7
1931-1940
11.8
10.2
1931-2020
13.7
10.2
1922-2020
14.0
10.6
1914-1945
15.6
13.8
1914-2020
14.4
11.1
1906-2020
14.6
11.5
1896-1921
16.8
15.5
1896-2020
14.6
11.6
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
Natural Flow
Historic Flow

LEGAL MATTERS

Litigation Summary

Commission legal staff continues to inform the Commissioners, their advisers and other interested parties about developments in the courts, Congress and certain federal agencies. In particular, during Water Year 2020, action of importance to the Upper Colorado River Basin States was taken in the following case:

Save the Colorado, Living Rivers and Center for Biological Diversity vs. United States Department of Interior and David Bernhardt, Secretary of the Interior, CV-19-08285, D. Arizona (2019).

On October 1, 2019, Save the Colorado, Living Rivers, and Center for Biological Diversity ("Plaintiffs") filed suit in the U.S. District Court of Arizona to challenge the Secretary and Department of the Interior's environmental analyses and decision under the National Environmental Policy Act ("NEPA") to re-operate Glen Canyon Dam according to criteria set forth in the 2016 Long-Term Experimental and Management Plan ("LTEMP"). The Colorado River Basin States have a significant interest in how and under what authorities Glen Canyon Dam is operated consistent with the Law of the River.

Six Basin States (New Mexico abstained from joining, stating it expects to file an amicus brief in the case supporting the position of the other Basin states) were granted permission to intervene. On June 2, 2020, the Department of Justice filed the Administrative Record. Plaintiffs objected to the sufficiency of that record. For the remainder of 2020 the Plaintiffs and the United States were involved in a challenge relating to the sufficiency of the administrative record. The states chose not to participate in that challenge, which continued into 2021. Once issues related to the administrative record are resolved the states expect substantive briefing to occur. Colorado's attorneys lead the coordination effort among the Basin States.

COLORADO RIVER SALINITY PROGRAM

The Upper Colorado River Commission has continued its interest and involvement in the Colorado River Basin salinity control efforts. The Commission staff has worked with representatives of the Commission's member States, particularly through the Colorado River Basin Salinity Control Forum, which is composed of representatives from the seven Colorado River Basin States. The Forum has developed water quality standards, including a plan of implementation, to meet Clean Water Act requirements. Section 303 of the Clean Water Act requires that water quality standards be reviewed at least once during each three-year period. In 2020, the Forum reviewed the existing State-adopted and Environmental Protection Agency-approved numeric salinity criteria and found no reason to recommend changes for the three Lower Basin mainstem stations which are as follows:

Salinity in (mg/l)
Below Hoover Dam 723
Below Parker Dam 747
At Imperial Dam 879

The Forum then updated its plan of implementation. For a number of years, the States, the Upper Colorado River Commission and the Forum have worked with Reclamation to continue to update its river model (CRSS) that can reproduce flows and salinity concentrations of the past and predict probabilities of flows and salinity concentrations in the future. This model is used as a tool in preparation of the reviews.

The Salinity Control Program has been successful in implementing controls that have reduced the average concentrations at all three downstream stations by about 100mg/L. The salinity standards are based on long-term average flows, and the river model can assist with the analysis of future salinity control needs. The 2020 Review recognized existing measures in place which control about 1.2 million tons of salt annually and the need to implement new measures over the triennial review period to control an additional 62,400 tons annually. Looking to out years, the Forum identified a program to control a total of 1.70 million tons annually by the year 2040. The Salinity Control Program is not designed to offset short-term variances caused by short-term hydrologic differences from the norm.

The Forum has also been heavily involved in working with Reclamation on identifying a brine disposal alternative for Reclamation's Paradox Valley Unit. This unit has historically reduced the salt load of the Colorado River by about 100,000 tons of salt per year, but seismic concerns from deep-well injection have caused Reclamation to seek a new disposal alternative.

COLORADO RIVER STORAGE PROJECT (CRSP) AND PARTICIPATING PROJECTS

AUTHORIZED STORAGE UNITS

Information relative to storage units and participating projects has been provided by the United States Department of the Interior, Bureau of Reclamation, Interior Region 7: Upper Colorado Basin.

The guiding force behind development and management of water in the Upper Basin is the Colorado River Storage Project (CRSP). Authorized by the Colorado River Storage Project Act of 1956 (Public Law [P.L.] 485, 84th Congress, 70 Stat. 105) (CRSPA), the CRSP allows for the comprehensive development of water resources of the Upper Basin States while providing for long-term regulatory storage of water to meet the entitlements of the Lower Basin. The CRSP is one of the most complex and extensive river resource developments in the world and was integral to the development of the arid West.

Four initial storage units were authorized by the 1956 Act: the Glen Canyon Unit on the Colorado River in Arizona and Utah; the Flaming Gorge Unit on the Green River in Utah and Wyoming; the Navajo Unit on the San Juan River in Colorado and New Mexico; and the Wayne N. Aspinall Unit, formerly named the Curecanti Unit and rededicated in July 1981, on the Gunnison River in Colorado. The Aspinall Unit consists of Blue Mesa, Morrow Point, and Crystal dams and reservoirs. Combined, the four main storage units provide about 30.6 million acre-feet of live water storage capacity. The CRSPA also authorized the construction of eleven participating projects. Additional participating projects have been authorized by subsequent Congressional legislation.

As stated in the CRSPA, the CRSP was authorized "[I]n order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes." Key benefits are also provided for recreation and for fish and wildlife needs and other environmental considerations per the Colorado River Basin Project Act of 1968 (CRBPA), National Environmental Policy Act of 1969 (NEPA), Endangered Species Act of 1973 (ESA), and Grand Canyon Protection Act of 1992 (GCPA).

The CRSP initial storage units and authorized participating projects are described in this 72nd Annual Report and earlier annual reports of the Upper Colorado River Commission. Outlined below are updates on construction, operation and

maintenance, power generation, recreational use, invasive mussel control, planning investigation activities, reservoir operations, and appropriations of funds for the storage units and participating projects accomplished during the past water year (October 1, 2019 to September 30, 2020), the federal fiscal year (October 1, 2019 to September 30, 2020), and the calendar year (2020). Significant upcoming or projected information is also included for some storage units and projects.

Glen Canyon Unit

Glen Canyon Dam and Reservoir (Lake Powell) comprises the key storage unit of the CRSP and is the largest of the initial four, providing about 80% of the storage and generating capacity. Construction of the dam was completed in 1963.

At optimum conditions, the eight generators at Glen Canyon Dam can produce 1,320 megawatts of power. Water is drawn into the power penstock intakes about 200-230 feet below the surface of Lake Powell at full pool, which results in clear cold water with year-round temperatures of 45° F to 50° F being released from Glen Canyon Dam. During protracted droughts, such as has occurred since 2000, Lake Powell elevations decline to levels where warmer water is drawn through the penstocks and released downstream.

Figure 3. Turbines at Glen Canyon Dam

Since the damming of the river in 1963, there has been only one flow release that approached average pre-dam spring floods. In 1983, unanticipated hydrologic events in the Upper Colorado River Basin, combined with a lack of available storage

space in Lake Powell and resulted in emergency releases from Glen Canyon Dam that reached 93,000 cubic feet per second (cfs). Except for the flood events of the mid-1980s, historic daily releases prior to the preparation of the final 1995 Glen Canyon Dam Environmental Impact Statement (EIS) generally ranged between 1,000 cfs and 25,000 cfs, with flows averaging between 5,000 cfs and 20,000 cfs.

As a result of the construction and operation of Glen Canyon Dam, the Colorado River ecosystem below the dam has changed significantly from its pre-dam natural character. In addition, the dam's highly variable flow releases from 1964 to 1991 caused concern over resource degradation resulting from dam operations. Because of these concerns, the Secretary of the Interior (Secretary) adopted interim operating criteria in October 1991 that narrowed the range of daily powerplant fluctuations.

Responding to concerns that changes to the Colorado River ecosystem were resulting from dam operations, Reclamation launched the Glen Canyon Environmental Studies program in 1982. The research program's first phase (1982-1988) focused on developing baseline resource assessments of physical and biotic resources. The second phase (1989-1996) introduced experimental dam releases and expanded research programs in native and non-native fishes, hydrology and aquatic habitats, terrestrial flora and fauna, cultural and ethnic resources, and social and economic impacts.

By the late 1980s, sufficient knowledge had been developed to raise concerns that downstream impacts were occurring, and that additional information needed to be developed to quantify the effects and to develop management actions that could avoid and/or mitigate the impacts. This collective information, and other factors, led to a July 1989 decision by the Secretary to direct Reclamation to prepare an EIS on the operation of Glen Canyon Dam. The intent was to evaluate alternative dam operation strategies to lessen the impacts of operations on downstream resources.

In October 1992, President George H.W. Bush signed into law the Reclamation Projects Authorization and Adjustment Act, P.L. 102-575. Responding to continued concerns over potential impacts of Glen Canyon Dam operations on downstream resources, Congress included the Grand Canyon Protection Act (GCPA) as Title 18 of this Act. Section 1802(a) of the GCPA requires the Secretary to operate Glen Canyon Dam:

"… in accordance with the additional criteria and operating plans specified in Section 1804 and exercise other authorities under existing law in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use."

The GCPA directs the Secretary to implement this section in a manner fully

consistent with all existing laws that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin.

Section 1804 of the GCPA required preparation of an EIS, adoption of operating criteria and plans, reports to Congress, and allocation of costs. The Operation of Glen Canyon Dam Final Environmental Impact Statement (FEIS) was filed with the Environmental Protection Agency in March 1995 and a Record of Decision (ROD) was signed in October 1996. Following the signing of the ROD, the Secretary adopted a formal set of operating criteria (February 1997) and the 1997 Annual Plan of Operations. This action terminated the 1991 interim operating criteria.

The signing of the 1996 ROD began a new chapter in the history of Glen Canyon Dam. In addition to meeting traditional water and power needs, the dam was now being operated in a more environmentally-sensitive manner. The EIS process demonstrated the value of a cooperative, integrative approach to dealing with complex environmental issues. The inclusion of stakeholders resulted in a process that served to guide future operations of Glen Canyon Dam and became a template for other river systems.

Adaptive Management

The Glen Canyon Dam Adaptive Management Program (AMP) was implemented following the 1996 ROD on the Operation of Glen Canyon Dam FEIS to comply with consultation requirements of the GCPA. The 2016 ROD for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP) FEIS confirmed the continuation of the AMP. The AMP provides an organizational structure and process to ensure the use of scientific information in decision making for Glen Canyon Dam operations and protection of downstream resources in Glen Canyon and Grand Canyon consistent with the GCPA.

The AMP includes the Adaptive Management Work Group (AMWG) federal advisory committee, Secretary's Designee, Technical Work Group, U.S. Geological Survey's Grand Canyon Monitoring and Research Center, and independent scientific review panels. Regional Directors from Department of the Interior bureaus such as Reclamation and the National Park Service (NPS) also facilitate communication and cooperation within the AMP. The AMWG makes recommendations to the Secretary concerning Glen Canyon Dam operations and other management actions to protect resources downstream of the dam consistent with the GCPA and other applicable provisions of federal law.

A diverse group of 25 stakeholders from federal, state, and tribal governments; contractors who purchase power from Glen Canyon Dam; and environmental and recreational organizations participate in the AMP and each has a voice in formal recommendations. AMP stakeholders have divergent views on the interpretation of the GCPA, particularly with regard to how it may or may not amend previous statutes related to the operation of Glen Canyon Dam. While each stakeholder

represents their own interests, they also work together for the common good of protecting the ecosystem downstream from Glen Canyon Dam and meeting provisions of the GCPA, ESA, National Historic Preservation Act, and other relevant federal laws.

Current efforts in the AMP include improving the status of the endangered humpback chub and razorback sucker, the conservation of sediment to rebuild beaches in Glen and Grand canyons, and the protection of cultural resources. The U.S. Fish and Wildlife Service published a proposed rule on January 22, 2020, to reclassify the humpback chub as a threatened species. Concerns related to recent increases of non-native brown trout in Glen Canyon and appropriate management actions in response to those increases are a developing issue in the AMP.

The AMP will continue to make progress in forming partnerships among participants, understanding resource issues, and experimenting with dam operations and other management actions to better accomplish the intent of the LTEMP ROD and GCPA.

Record of Decision for the Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead

Against the backdrop of the worst drought in over a century on the Colorado River, and pursuant to a Secretarial directive to finish this effort by 2007, Reclamation worked with the Basin States through a NEPA process to develop interim operational guidelines for Lake Powell and Lake Mead to address drought and low reservoir conditions. These operational guidelines provided Colorado River water users and managers in the United States a greater degree of certainty about how the two large reservoirs on the Colorado River will be operated under low water conditions, and when – and by how much – water deliveries will be reduced to the Lower Basin states of Arizona, California, and Nevada in the event of drought or other low reservoir conditions. In a separate, cooperative process, Reclamation worked through the State Department to consult with Mexico regarding potential water delivery reductions to Mexico under the 1944 Treaty with the United States.

A ROD was signed by the Secretary in December 2007 that implements the interim operational guidelines that will be in place through 2026. The key components of the guidelines are: (1) a shortage strategy for Lake Mead and the Lower Division states, (2) coordinated operations of Lakes Powell and Mead through a full-range of operations, (3) a mechanism for the creation and delivery of conserved system and non-system water in Lake Mead (Intentionally Created Surplus), and (4) the modification and extension of the existing Interim Surplus Guidelines.

The ROD also requires that the Secretary, in consultation with Basin States, initiate a formal review for the purposes of evaluating the effectiveness of the Interim Guidelines prior to the end of 2020. The Secretary announced, at the Colorado River Water Users Association (CRWUA) meeting in December of 2019, that

Reclamation would begin the review in early 2020 with the goal of completing it by the next CRWUA meeting in 2020.

Record of Decision for the Glen Canyon Dam Long-Term Experimental and Management Plan Final Environmental Impact Statement

As directed by the Secretary in December 2010, Reclamation and the NPS developed the LTEMP EIS for Glen Canyon Dam. A Notice of Intent was published in the Federal Register in July 2011 that identified Reclamation and the NPS as co-leads in keeping with their respective authorities for dam operations and park management. Scoping was completed early in 2012 and the LTEMP draft EIS was published in January 2016. The LTEMP FEIS was published in October 2016 and the Secretary signed the LTEMP ROD in December 2016. The FEIS and ROD provide a comprehensive framework for adaptively managing Glen Canyon Dam over the next 20 years consistent with the GCPA and other provisions of applicable federal law.

The purpose of the LTEMP is to guide facility operations through use of our scientific understanding of the ecosystem downstream from Glen Canyon Dam to protect, mitigate adverse effects to, and improve important downstream resources, while maintaining compliance with relevant laws including the GCPA, ESA, and the numerous compacts, federal laws, court decisions and decrees, contracts, and regulatory guidelines collectively known as the "Law of the River." The LTEMP EIS development process involved extensive coordination with 15 cooperating agencies (including six Native American tribes). A primary function of the LTEMP is to continue successful experimentation under the Glen Canyon Dam AMP.

Dam operations and other actions under the jurisdiction of the Secretary were considered in the LTEMP EIS alternatives that are consistent with the scope of the GCPA. The EIS identified a preferred alternative, which was developed later in the EIS process by combining attributes of the existing alternatives to achieve the best balance of resources given the purpose and need for the EIS. The selected alternative includes high-flow experiments, more equal monthly release volumes than the No Action Alternative, and several new tools for fish management. The selected alternative is expected to improve sediment conditions below the dam and have slightly positive effects to endangered fish (humpback chub) but have slightly negative impacts (approximately 0.17% increase in cost) to hydropower. The ROD specified a phased implementation, with LTEMP monthly volumes beginning January 1, 2017, and experiments beginning after October 1, 2017.

The LTEMP EIS five-year development process included extensive stakeholder outreach and consultation. Stakeholder involvement through the scoping process, draft EIS review period, and subsequent outreach efforts was instrumental in assuring a full range of alternatives. The LTEMP includes a communication and consultation process that ensures input and consultation with stakeholders

throughout the 20-year implementation.

Drought Contingency Planning

While the Interim Guidelines provided for coordinated operations of Lake Powell and Lake Mead and some shortage provisions, these actions were not considered sufficient to address the unanticipated continuation of the current drought. In 2013, in response to the continuing drought in the Colorado River Basin, the Secretary again encouraged the Basin States to develop additional measures or Drought Contingency Plans (DCP). In the Upper Basin the DCP effort was led by the Upper Division States and Upper Colorado River Commission with Reclamation facilitation. The Upper Basin DCP includes three elements:

1) Weather modification (being conducted by the States pursuant to existing agreements);
2) Drought response operations – an agreement between the States and Reclamation that provides a process whereby, if Lake Powell is projected to reach critical elevations, the States and Reclamation will convene to develop a specific drought operations plan to move water from the upper CRSP reservoirs to Lake Powell to reduce the potential for it to drop below critical elevations for power generation and water release, and to subsequently recover any released water in the participating reservoir/s; and
3) Demand management – an agreement between the States and Reclamation to evaluate the feasibility of developing a program for the voluntary, compensated, and temporary reductions of consumptive water use, resulting in additional water remaining in the system that could be stored without charge to the States in CRSP reservoirs, which would in turn contribute to storage in Lake Powell.

The Lower Division States of Arizona, California, and Nevada, together with key water users in those states, developed the Lower Basin DCP (consisting of the LB Drought Contingency Plan Agreement and the LB Drought Operations Exhibit) designed to contribute additional water to Lake Mead at predetermined elevations and to incentivize additional voluntary conservation of water to be stored at Lake Mead. The DCPs were signed on May 20, 2019 at a ceremony conducted at Lake Mead. The final documents are available on Reclamation's website[9].

Lake Powell Pipeline

If approved, Lake Powell would be the point of diversion and the location for the pumping plant infrastructure for the Lake Powell Pipeline, a water development project undertaken by the state of Utah for municipal use in southwestern Utah. The project contemplates a contract between the State of Utah and Reclamation wherein Utah would forbear the diversion of a portion of the natural flows of the

[9] U.S. Bureau of Reclamation Website. Webpage: https://www.usbr.gov/dcp/finaldocs.html. Accessed on March 29, 2021.

Colorado River to which it is entitled under the Upper Colorado River Basin Compact and the Colorado River Compact (Compacts) and allow these flows to contribute to meeting the Endangered Species Act requirements in Reaches 1 and 2 of the Green River. In exchange, Utah would deplete an equal amount of water released from Flaming Gorge Dam throughout the year and available for diversion at Lake Powell.

Reclamation published a Draft Environmental Impact Statement (EIS) for the Lake Powell Pipeline in June 2020. Over 14,000 comments were received with the substantive comments largely focused on: the need for a more aggressive conservation alternative to be analyzed in the EIS, Colorado River Compact(s) compliance, more information needed regarding hydrologic modeling and the impacts of climate change. Those comments are being addressed in a Supplemental Draft EIS. The state of Utah is working with the Upper and Lower Basin States and UCRC staff to address issues that arose related to the publication of the Draft EIS. Finally, Reclamation and the other federal agencies are working with area Tribes to ascertain and address their concerns.

Recreational Use

Glen Canyon National Recreation Area (NRA), which surrounds Lake Powell, hosted 2,553,392 visitors during calendar year 2020. The decrease in visitation is undoubtedly due to the COVID-19 pandemic and subsequent loss of international visitors. The National Park Service has concession-operated facilities at Wahweap, Dangling Rope, Halls Crossing, Hite, and Bullfrog Basin on the reservoir, and at Lees Ferry, located 15.8 miles below Glen Canyon Dam. The Navajo Nation operates a marina at Antelope Point.

Rainbow Bridge, considered a sacred site by Native Americans, saw visitation of 3,573 during calendar year 2020. The NPS has requested that visitors respect the site and keep from approaching too closely or walking under the bridge. Personal watercraft use in the Rainbow Bridge area has been banned since 2000.

The Carl B. Hayden Visitor Center, adjacent to Glen Canyon Dam and powerplant in Page, Arizona, is owned and maintained by Reclamation and operated by the NPS. The Glen Canyon Natural History Association conducts public tours of the dam during normal years; and reports that 4,254 people took the dam tour during the time the visitor center was open from January 2-March 17, 2020. The visitor center was closed March 18, 2020, and tours discontinued due to the COVID-19 pandemic. During this same timeframe, 84,543 people stopped at the visitor center for a look around.

Invasive Mussel Control

Invasive Quagga mussels were confirmed in Lake Powell in 2012 and are now found throughout the reservoir. Veligers (young mussels) are passing through the dam and adult mussels are prevalent in the Glen Canyon stretch of the river below the

dam; small numbers have also been found in the Grand Canyon stretch.

At this time, the mussels have not adversely affected the operation of the Glen Canyon Dam and Powerplant due to a proactive approach to mussel control and prevention. The most noticeable of the impacts thus far have been to the Dam fixed wheel gates and the Plant cooling water systems. Maintenance on the fixed wheel gates has increased due to the gates being coated with two to three inches of quagga mussels and quagga mussels shell debris has been noticed in Plant water lines fed by Lake Powell (raw water). To combat these issues, Glen Canyon Field Division is in the process of installing mussel control equipment (strainers and ultraviolet light systems) on the raw water lines to prevent mussels from obstructing flow in the lines. Reclamation is also doing research on new or unproven methods to prevent mussels from settling on submerged infrastructure.

Flaming Gorge Unit

Construction of Flaming Gorge Dam was completed in 1962. The dam is located on the Green River in northeastern Utah, about 32 miles downstream from the Utah-Wyoming border. In December 1962, the waters of the Green River began filling the reservoir behind Flaming Gorge Dam. Nearly a year later, in September 1963, President John F. Kennedy initiated the first power generation at Flaming Gorge Powerplant. There are three generating units in the Flaming Gorge Powerplant. Uprating of the units in 1992 increased the plant's nameplate capacity from 108 megawatts to about 151 megawatts. Flaming Gorge Powerplant produces approximately 500,000,000 kilowatt-hours of energy annually to Arizona, Colorado, Nebraska, Nevada, New Mexico, Utah, and Wyoming.

Figure 4. Overlook of Flaming Gorge Dam near Dutch John, Utah. This hydropower dam is on the Green River and is part of the Colorado River Storage Project.

Flaming Gorge Reservoir extends as far as 91 miles upstream and is part of the Flaming Gorge NRA. When the reservoir is full, at elevation 6,040 feet above sea level, it has a capacity of 3,788,900 acre-feet and a surface area of 42,020 acres. Within the reservoir area there are two distinct types of land: a mountainous area in Utah and a desert area in Wyoming.

Community of Dutch John

The community of Dutch John, Utah, located about two miles northeast of the dam, was founded by the Secretary in 1958 as a community to house personnel, administrative offices, and equipment for construction and operation of Flaming Gorge Dam and powerplant. Dutch John was managed by Reclamation as a residential area to house staff involved in the operation, maintenance, and administration of Flaming Gorge Dam until 1998 when it was privatized and transferred to the local government.

Flow and Temperature Recommendations and Larval Trigger Study Plan

In September 2000, a final report entitled Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam was published by the Upper Colorado River Endangered Fish Recovery Program (Upper Colorado Recovery Program). The report, prepared by a multi-disciplinary team, synthesizes research conducted on endangered fish in the Green River under the Upper Colorado Recovery Program and presents flow recommendations for three reaches of the Green River. In 2006, Reclamation completed a NEPA process for implementation of an operation at Flaming Gorge Dam that meets the flow recommendations. The Operation of Flaming Gorge Dam FEIS was published in November 2005 and a ROD was signed in February 2006. Flaming Gorge Dam is operated in accordance with the 2006 ROD and the September 2005 Biological Opinion on the Operation of Flaming Gorge Dam.

Reclamation has worked with the Upper Colorado Recovery Program to implement the Larval Trigger Study Plan (LTSP) since 2012, which involves timing spring peak flows with the emergence of larval razorback sucker. The goal of these operations is to provide the larval fish access to rearing habitat in floodplain wetlands. Thousands of wild spawned razorback sucker have resulted from these operations since their implementation, which is a significant step toward recovery of razorback sucker. In 2019 and in 2020, Reclamation operated Flaming Gorge Dam to provide several days of access to floodplain wetlands for larval fish, which resulted in production of several hundred razorback sucker in 2019 (plus at least two wild spawned bonytail) but only 32 fish in 2020 due to excessive growth of cattails. 2020 was also the first year in which LTSP-produced razorback sucker were documented as mature fish on a spawning bar near Jensen, UT, the first evidence of recruitment to adulthood resulting from the LTSP process. Reclamation also worked within the flexibility of the ROD in 2019 and 2020 to provide relatively high base flows during summer months, which optimizes nursery habitat for the endangered Colorado pikeminnow.

Recreational Use

The interagency agreement between Reclamation and Ashley National Forest (U.S. Forest Service) for joint management of facilities within the primary jurisdiction area expired December 31, 2013, and the U.S. Forest Service declined to enter into another agreement. As a result, operation of the visitor center is now Reclamation's sole responsibility. The visitor center is operated under a license agreement with the Intermountain Natural History Association (INHA) from April to mid-October. The license was renewed in 2019 for another 5-year term. INHA reports that 10,585 people visited the center during August, September, and October of 2020. The visitor center was closed during winter 2020 and through the months of April-July due to the COVID-19 pandemic. No public tours were given at this location during 2020.

Public tours of the dam are normally conducted April 15, through October 15, of each year through a contract with Choice Services, Inc., but were discontinued this year due to the pandemic. Tours of the inside of the dam are conducted when the security threat advisory is low. When the security threat advisory is high, tours of the inside of the dam are suspended and tourists are taken to a dam overlook area where guides present information about construction and operation of the dam.

An effort is underway to remodel the interior of the visitor center, update the exhibits, and remodel the public restrooms. The acquisitions package is being prepared and is planned to go to bid in 2021. Work will not start until after the October seasonal closure.

The Flaming Gorge NRA, located in the states of Utah and Wyoming, is administered by the Ashley National Forest. Some visitation figures were received from the U.S. Forest Service for this past year and it is estimated that 291,386 visitors enjoyed the reservoir and surrounding environs in 2019.

The planning effort to close 12 recreation sites on the east side of the forest (9 of which were in the NRA) was cancelled by the U.S. Forest Service in early 2020.

Invasive Mussel Control

Invasive mussel control at Flaming Gorge Reservoir is the responsibility of the states of Utah and Wyoming as well as marina owners and visitors. Reclamation periodically performs plankton towing (a sampling method) and sends the samples to its labs in Denver where tests are completed to detect the presence of veligers. The Utah Division of Wildlife Resources reports that DNA has been detected at Flaming Gorge during sampling at least once, but the reservoir is not considered to be infested at this time. Monitoring for invasive mussels continued in 2018 and shows no presence of veligers or adult mussels.

Navajo Unit

Navajo Dam was completed in 1963. The water stored behind Navajo Dam,

pursuant to the CRSPA, provides a water supply for the Navajo Indian Irrigation Project near Farmington, New Mexico, and the Hammond Project, a CRSPA participating project. In addition, water for the Jicarilla Apache Nation is also available in Navajo Reservoir pursuant to the December 8, 1992 contract between the Jicarilla Apache Nation and the United States which was executed as part of the Jicarilla Apache Nation Water Rights Settlement Act of January 3, 1992 (P.L. 102-441). The water supply for the Navajo-Gallup Water Supply Project will also be provided in part by Navajo Reservoir, as was provided in the Omnibus Public Land Management Act of March 30, 2009 (P.L. 111-11).

Reclamation published the Navajo Reservoir Operations FEIS on April 20, 2006, and the ROD was signed on July 31, 2006. Reclamation's decision was to implement the preferred alternative identified in the 2006 ROD with reservoir releases ranging from 250 to 5,000 cfs. The preferred alternative, to the extent possible, implements criteria needed to assist in meeting flow recommendations for the endangered fish in the San Juan River, while assisting both current and future water development in the San Juan River Basin to proceed in compliance with the ESA and other state and federal laws. Navajo Dam is operated in accordance with the 2006 ROD.

Figure 5. Water from Navajo Reservoir is released down the Navajo Dam spillway. The dam is located on the San Juan River, 34 miles east of Farmington, New Mexico. (Reclamation photo by S. Pernick)

Recreational Use

Recreation at Navajo Reservoir is managed by the states of Colorado and New Mexico through recreation leases with Reclamation. The Colorado portion of the reservoir, or Navajo State Park, is managed by Colorado Parks and Wildlife (CPW).

The New Mexico portion of the reservoir, or Navajo Lake State Park, is managed by the New Mexico State Parks Division (New Mexico State Parks). New Mexico State Parks returned a large portion of the lands around Navajo Reservoir to Reclamation for management after a new statewide recreation lease agreement was signed. New Mexico State Parks wants to reduce its footprint and responsibility to the developed areas and nearby heavily visited primitive areas due to reduced resources. It will, however, continue boating patrols for enforcement of boating laws outside its formal boundary.

Visitation for Navajo Reservoir was reported to be 390,775 on the Colorado side during 2020, and 671,273 on the New Mexico side. This increased visitation occurred even during the pandemic and while New Mexico State Parks was closed to out of state visitors for most of the year. With little left to do beside isolate, recreation in the outdoors increased significantly in many areas throughout the region.

Invasive Mussel Control

Reclamation is working with both recreation managing entities to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures and contracting for private inspection and decontamination services in New Mexico. CPW is conducting boat inspections and has a portable boat wash and decontamination unit at Arboles, Colorado. Reclamation engaged the services of a private contractor in 2016 to assist the New Mexico Department of Game and Fish (NMDGF) with boat inspection and decontamination services at Navajo Reservoir. Numbers are reported by both agencies on the calendar year. For the New Mexico side, a total of 14,542 inspections through November 2020 (final annual report not yet received) and 2 vessels with verified contamination (observed mussels, alive or dead) were fully decontaminated and 95 standing water decontaminations were performed (suspected mussels). On the Colorado side, 26,522 total inspections were performed with 520 hot water decontaminations and one zebra/quagga interception. To date, mussel testing results in the reservoir have been negative. Reclamation is working with New Mexico State Parks and the NMDGF for design and construction of a permanent boat inspection and decontamination station at Navajo Lake State Park. Sixty percent design drawings for the inspection and decontamination site are complete. Due to concerns about drainage water, a water recycling option has been chosen to address those concerns about permitting and the chance that disposal of wastewater in the sewer system could lead to mussel survival if the drainage system is not periodically dewatered or chemically treated. This led to a delay in choosing a final option. The specifications have been drafted and the package will go out for bid in 2021.

Wayne N. Aspinall Unit

The Wayne N. Aspinall Unit (Aspinall Unit) includes Blue Mesa, Morrow Point, and Crystal dams, reservoirs, and powerplants. Construction of the three Aspinall Unit

dams was completed in 1976. The Aspinall Unit is located in Gunnison and Montrose counties, Colorado, on the Gunnison River upstream from Black Canyon of the Gunnison National Park. At optimum operations, the generators at Blue Mesa, Morrow Point, and Crystal powerplants are capable of producing a total of 290 MW of power.

Figure 6. Spillway at Crystal Dam located six miles downstream from Morrow Point Dam and 20 miles east of Montrose, Colorado. This hydropower dam is part of the Aspinall Unit, a set of three dams on the Gunnison River that are all part of the Colorado River Storage Project.

Similar to Glen Canyon, Flaming Gorge, and Navajo dams, the Aspinall Unit is being evaluated to determine how operations can be modified to assist in the recovery of downstream endangered fish. Flow recommendations for endangered fish in the Gunnison River were completed in 2003. Reclamation published the Aspinall Unit Operations FEIS in February 2012. The preferred alternative provides operational guidance for the Aspinall Unit for specific downstream spring peak and duration flows that are dependent on forecasted inflow to the Aspinall Unit reservoirs. It also provides base flows outside of the spring runoff period. The U.S. Fish and Wildlife Service completed a programmatic biological opinion for the EIS which addresses proposed operation changes as well as coverage of existing water uses in the Gunnison Basin. The biological opinion also completes ESA compliance for

the Dallas Creek and Dolores projects. The ROD was issued in May 2012.

Recreational Use

Recreation use for the Aspinall Unit is managed by the NPS as the Curecanti National Recreation Area (NRA). Visitation to the NRA for calendar year 2020 was reported to be 921,584. Visitation to the Black Canyon of the Gunnison located below Crystal Dam and adjacent to the Curecanti NRA was reported to be 341,620 for this same time-period.

In 1965, the NPS entered into an agreement with Reclamation to construct and manage recreational facilities and to manage natural and cultural resources and recreation on, and adjacent to, the three reservoirs. This area became known as the Curecanti NRA. The NRA is currently identified by an administrative boundary that has not been established by legislation.

Invasive Mussel Control

The State of Colorado, working in partnership with the NPS, has instituted an aggressive program to prevent the spread of quagga and zebra mussels into its waters, including the three Aspinall Unit reservoirs. All motorized and watercraft requiring a trailer to launch at Curecanti NRA are required to be inspected for invasive mussels and, if necessary, decontaminated. In addition to the mandatory inspection prior to launch, and to be in compliance with the State of Colorado's Aquatic Nuisance Species (ANS) protocols, all motorized watercraft leaving Blue Mesa, Morrow Point, or Crystal reservoirs will undergo a second inspection to verify the watercraft has been cleaned, drained, and dried. Reclamation is continuing to test for zebra or quagga mussels in mountain lakes and so far, has found no evidence of either mussels or veligers.

INVASIVE MUSSEL CONTROL

Invasive species threaten the operation of CRSP facilities. An Upper Colorado Basin Invasive Mussel Response Plan was developed in 2010. The program focuses on four areas: monitoring and sampling, engineering solutions, maintenance techniques, and operational practices. Reclamation has also launched an extensive public outreach campaign to educate the public with radio and television spots as well as print advertisements in local tourism magazines.

In 2017, a value planning study was conducted in the Upper Colorado River Basin to determine ways to prevent the further spread of quagga mussels throughout the region. This effort brought together state, federal, and university personnel from more than ten different disciplines and three states. The study highlighted the need for an economic study quantifying the financial impacts of a quagga infestation and the need to develop an assessment process for determining and comparing the susceptibility of water bodies.

The State of Colorado's ANS program was funded through severance tax of oil and

gas production; this tax was all but eliminated in 2016. And while the State lost the majority of its ANS funding for boat inspection activities in 2017 due to a decision by the Colorado Supreme Court, Reclamation received funding from the Secretary that kept boat ramps open full time in 2017 and contributed toward keeping inspection stations open in 2018.

Figure 7. Eight years' worth of quagga mussels accumulated on a wheel gate pulled out of the water for maintenance at Glen Canyon Dam, Arizona. These nonnative species anchor themselves to nearly any surface near running water and reproduce rapidly. Mussel populations have covered boats, marina docks, motors, pipes and other water works in many Reclamation infrastructures, reducing the efficiency of these resources.

In 2018, Colorado's governor signed the Mussel-free Colorado Act, which requires that all boaters registering vessels in the State of Colorado purchase an ANS stamp. In addition, the Act increases existing penalties and imposes new penalties on several actions regarding invasive species violations.

In 2019, the Western Colorado Area Office created and funded a 5-year 50% cost-share grant with Colorado Parks & Wildlife (CPW) for $151,656 for ANS boat inspection and decontamination on seven reservoirs: Navajo, Mancos/Jackson Gulch, Ridgway, Crawford, Paonia, Vega and Rifle Gap. Previous ANS funding was included in the Operations and Maintenance Grant with CPW. This grant allows more direct earmarking of funding specifically for ANS.

TABLE 9. Total Annual Inspections and Decontaminations on Western Colorado Area Office Reservoirs

Location	Total Inspections	Incoming	Outgoing	Off-Water	Total Decons	ZQM Interceptions
Crawford	2,599	1,417	1,182	0	26	0
Lake Nighthorse	5,392	2,619	2,772	1	122	0
Mancos	192	116	69	7	4	0
McPhee Reservoir	11,351	5,955	5,385	11	418	1
Navajo	26,522	13,354	13,121	47	520	1
Paonia Reservoir	421	208	213	0	2	0
Ridgway	8,436	4,362	4,074	0	446	3
Rifle Gap	9,540	5,194	4,303	43	248	8
Taylor Park Reservoir	3,590	1,815	1,775	0	12	0
Vallecito Reservoir	7,972	4,026	3,915	31	227	1
Vega Reservoir	2,193	1,294	899	0	27	0
TOTALS:	79,972	41,405	38,416	151	2,052	14

Courtesy of CPW (Robert Walters, DNR)

Please refer to Table 9 for the total annual inspections and decontaminations on Reclamation Reservoirs in Western Colorado in 2020. In partnership with the Dolores Water Conservancy District, CPW (and as funding is available, the U.S. Forest Service), Reclamation contributed $23,000. On Lake Nighthorse, within Durango City Limits, Reclamation contributed approximately $20,000, and provides the decontamination unit. Lemon Reservoir remains closed to motorized boating.

Colorado's U.S. Senator Michael Bennett introduced the "Stop the Spread of Invasive Mussels Act of 2019", that was passed to allow federal agencies to implement containment or prevention actions. There is no funding attached to this Act.

The State of New Mexico has a smaller aquatic invasive species program that provides public outreach and education, spot inspections, and decontaminations when needed. Reclamation has entered into a contract with Rocky Mountain Recreation to conduct boat inspections and decontaminations at Navajo Reservoir (New Mexico side) and Elephant Butte Reservoir in New Mexico. Both boat ramps

on the New Mexico side of Navajo Reservoir are staffed by the contractor. CPW staffs the inspections on the Colorado side. During calendar year 2020, Rocky Mountain Recreation inspected 17,097 boats at Navajo Reservoir and decontaminated 142 of them.

The State of Utah continues to monitor park waters and, in conjunction with the NPS, has implemented mandatory boat inspections and decontaminations to minimize the spread of invasive mussels from Lake Powell and to manage park operations now that quagga mussels are present. The focus of this effort has shifted from prevention to containment and incorporates science and lessons learned from the Lake Mead National Recreation Area. In 2020, staff with the Utah Division of Wildlife Resources and Utah State Parks inspected 445,392 watercrafts statewide. This is a 45% increase from the number of inspections in 2019. Almost 11,000 boats were decontaminated, representing a 25% increase from the number of decontaminations during 2019.

STORAGE UNITS' FISHERY INFORMATION

The Glen Canyon, Flaming Gorge, Navajo, and Aspinall Units continue to provide excellent warm- and cold-water fishing both in the reservoirs and in the tailwater streams below the dams.

Lake Powell is almost exclusively a warm-water fishery with bluegill, striped bass, crappie, walleye, channel catfish, and smallmouth and largemouth bass as the targeted species. Lake Powell consistently is a high-quality fishery, even during lower water elevations. It is unknown at this time how the presence of invasive mussels will impact the fishery at Lake Powell, although if impacts from other lakes where they are present is any indication, the fishery may fall off over the next few years, with fewer fish and less robust game species available.

There is some anecdotal evidence that striped bass may eat at least some of the mussels. There is also evidence that some diving ducks and other species of fish may eat the mussels, but they are not providing effective control due to the high reproduction rate of the mussels. In addition, it is suspected that the mussels concentrate the botulism toxin, resulting in waterfowl mortality. Mussels also remove phytoplankton from the water column causing disruptions to the food web, and their waste products further alter the ecosystem.

The cool, clear depths of Flaming Gorge Reservoir remain ideal for several species of trout, including cutthroat, rainbow, lake, and brown. Kokanee salmon, smallmouth bass, and channel catfish are also abundant game fish. Fisheries managers are urging anglers to catch small size lake trout and keep them to improve the numbers and sizes of other sports fish, including the larger lake trout. Due to the presence of illegally stocked and invasive burbot, the Utah Division of Wildlife Resources requires any burbot caught to be killed. There is no limit on the number of burbot that can be taken from either the Utah or Wyoming sides of the

reservoir.

Navajo Reservoir provides both cold- and warm-water fisheries including catfish, crappie, and smallmouth bass in the shallows and near the reservoir surface. Kokanee salmon, northern pike, and many varieties of trout are found in the deeper, colder waters. Annually, during the late fall and early winter months, there is a snagging season for kokanee after the spawn and before the fish die.

The Aspinall Unit reservoirs are exclusively cold-water fisheries with six species of sport fish available: rainbow, mackinaw, brown, lake, and brook trout, as well as kokanee salmon. At one time, the Aspinall Unit reservoirs boasted the largest kokanee salmon fishery in the United States. However, kokanee populations decreased to below an estimated 200,000 several years ago due to predation by lake trout. At that time, CPW started a program to rebuild the population through increased stocking and continued removal of lake trout. The kokanee population is now estimated to be around 400,000.

The four tailwaters (the Colorado River below Glen Canyon Dam, the Green River below Flaming Gorge Dam, the San Juan River below Navajo Dam, and the Gunnison River below Crystal Dam) have provided excellent trout fishing that many view as some of the best in the western United States. The Flaming Gorge tailwater is designated a “blue ribbon” fishery by the Utah Division of Wildlife Resources and fish populations in the river have been counted as high as 22,000 individuals per river mile: the highest concentration in the West. The seven miles between Flaming Gorge Dam and Little Hole accommodate approximately 80% of the estimated 150,000 anglers who fish the Green River every year. New Mexico Game and Fish estimates that the tailwaters below Navajo Dam see 271,000 angler hours per year, and, on almost any day of the week, visitors can see anglers and guides plying the waters. The 26 miles of the Gunnison River below Crystal Dam through the Black Canyon are designated a “gold medal” fishery by CPW.

With the discovery of invasive adult mussels in the Colorado River below Glen Canyon Dam, it is unknown at this time how they might affect the fishery there. Another invasive, the green sunfish, was discovered in the summer of 2015 about four miles below Glen Canyon Dam. Due to concerns for endangered native fish species, treatments to remove green sunfish are applied annually and the monitoring of persisting populations continues. To further combat invasive species, the NPS developed an Expanded Non-native Aquatic Species Management Plan and Environmental Assessment. The UCRC was a Cooperating Agency in the development of the Environmental Assessment. A Finding of No Significant Impact (FONSI) was issued on October 3, 2019, authorizing NPS to proceed with implementing the plan.

CRSP POWER GENERATION

The CRSP is one of Reclamation’s key hydropower producing projects. The CRSP’s

combined installed capacity is over 1,800 MW with Glen Canyon Dam accounting for 1,320 MW alone. On average, the CRSP generates 5.6 billion kilowatt-hours per year, which accounts for about 15% of Reclamation's total annual production of approximately 40 billion kilowatt-hours. The CRSP provides power to nearly six million people living in Arizona, Colorado, Nebraska, Nevada, New Mexico, Utah, and Wyoming.

During fiscal years 2018 and 2019, generation at CRSP powerplants amounted to 5.51 and 5.02 billion kilowatt-hours, respectively. The major portion for those same years, 4.06 and 3.83 billion kilowatt-hours respectively, was produced at Glen Canyon Dam. The balance was produced at Flaming Gorge, Blue Mesa, Morrow Point, Crystal, Fontenelle, McPhee, and Towaoc powerplants. These amounts are shown in Table 10.

TABLE 10. Gross Generation (Kilowatt-Hours) and Percentage of Change for Fiscal Years 2019 and 2020

Powerplant	Fiscal Year 2019	Fiscal Year 2020	% Change
Glen Canyon	3,831,251,000	3,647,251,000	-4.8
Flaming Gorge	506,573,000	511,677,520	.1.0
Blue Mesa	167,605,340	260,441,000	55.4
Morrow Point	298,786,030	313,022,710	4.7
Crystal	134,775,950	173,169,620	28.4
Fontenelle	57,451,000	66,385,900	15.4
McPhee	4,302,893	4,618,120	7.3
Towaoc	17,305,070	17,752,000	2.6
Total	**5,018,050,283**	**4,993,317,860**	**-0.5**

CRSP Facility Upgrades

Over the next several years, nearly $130 million will be spent on major replacements at CRSP facilities. This work will help ensure that CRSP facilities throughout the Colorado River Basin remain reliable and efficient for many years to come. Examples of some of the major projects include:

Glen Canyon Powerplant

In fiscal years 2020 and 2021, Reclamation will replace the Glen Canyon Dam generator step-up transformers at a cost of $42.8 million. This project will replace the original transformers that have been in service for more than 50 years. This is one step in a much larger powerplant replacement project that has included turbine replacement and generator rewinds and will include plant switch gear replacement in the near future.

Blue Mesa Powerplant

Blue Mesa generator rewinds and exciter replacements began in fiscal year 2019 and are expected to be completed in fiscal year 2021. The old exciters are obsolete and not supported by the manufacturer. By replacing the static exciter with modern digital exciters, Reclamation expects to reduce maintenance costs and increase reliability. The generator windings are at the end of their service life and replacement of windings and refurbishment of the poles will enable continued operation for the next 25 years.

Flaming Gorge Powerplant

Flaming Gorge's station service switch gear will be replaced in fiscal year 2021. This power distribution equipment powers all of the ancillary equipment within the powerplant and dam such as pumps, computers, compressors, gates, and lighting.

AUTHORIZED PARTICIPATING PROJECTS

Twenty-two participating projects were originally authorized by Congress between 1956 and 1968. Eleven were authorized by the CRSP Act (CRSPA) of April 11, 1956 (70 Stat. 105), one was authorized in the 1956 Act by terms of its authorizing Act of June 28, 1949 (63 Stat. 277), two were authorized by the Act of June 13, 1962 (76 Stat. 96), three were authorized by the Act of September 2, 1964 (78 Stat. 852), and five were authorized by the Act of September 30, 1968 (82 Stat. 886). Of the 22 originally authorized participating projects, ten are in Colorado, two in New Mexico, two in Utah, three in Wyoming, three in both Colorado and New Mexico, one in both Colorado and Wyoming, and one in both Utah and Wyoming. In the 1968 Colorado River Basin Project Act, the Pine River Extension Project was deleted, leaving 21 participating projects authorized by Congress. On March 30, 2009, the Omnibus Public Land Management Act (123 Stat. 991) amended the CRSPA to include the Navajo-Gallup Water Supply Project in New Mexico as a participating project, increasing the number to 22 participating projects currently authorized by Congress.

Participating projects develop, or would develop, water in the Upper Colorado River system for irrigation, municipal and industrial uses, and other purposes, and participate in the use of revenues from the Upper Colorado River Basin Fund to help repay the costs of irrigation features that are beyond the ability of the water users to repay. The Basin Fund receives revenues from hydropower and water service sales.

To date, seventeen of the currently authorized 22 participating projects have either been completed or are in the process of completion. The five remaining participating projects were deemed infeasible or economically unjustified and were never constructed. Table 11 shows the seventeen participating projects that have been completed or are in the process of completion.

The 11 participating projects originally authorized in 1956 are:

1. Central Utah (Initial Phase), Utah
2. Emery County, Utah
3. Florida, Colorado
4. Hammond, New Mexico
5. La Barge, Wyoming
6. Lyman, Utah and Wyoming
7. Paonia, Colorado (works additional to existing project)
8. Pine River Extension, Colorado and New Mexico
9. Seedskadee, Wyoming
10. Silt, Colorado
11. Smith Fork, Colorado
12. In the 1956 Act, the Eden Project in Wyoming, by terms of its authorizing Act of June 28, 1949, became financially related to the CRSP as a participating project.

In 1962, authorizing legislation named the following two as participating projects:

13. Navajo Indian Irrigation, New Mexico (being constructed for the Bureau of Indian Affairs by Reclamation)
14. San Juan-Chama, Colorado and New Mexico

In 1964, authorizing legislation named an additional three as participating projects:

15. Bostwick Park, Colorado
16. Fruitland Mesa, Colorado
17. Savery-Pot Hook, Colorado and Wyoming

The CRBPA of September 30, 1968, authorized five additional projects as participating projects, but deleted the Pine River Extension Project as a participating project:

18. Animas-La Plata, Colorado and New Mexico
19. Dallas Creek, Colorado
20. Dolores, Colorado
21. San Miguel, Colorado
22. West Divide, Colorado

The Omnibus Public Land Management Act of 2009 amended the CRSPA of 1956 to include the following as a participating project:

23. Navajo-Gallup Water Supply, New Mexico

TABLE 11. CRSP Participating Projects
Completed or in the Process of Completion

#	Project	State(s)	Dam	Year Completed

1.	Eden	Wyoming	Big Sandy	1952
-----	Eden	Wyoming	Eden	1959
2.	Central Utah (Vernal Unit)	Utah	Steinaker	1962
3.	Hammond	New Mexico	---	1962
4.	Paonia	Colorado	Paonia	1962
5.	Smith Fork	Colorado	Crawford	1962
6.	Florida	Colorado	Lemon	1963
7.	Emery County	Utah	Joes Valley	1966
8.	Silt	Colorado	Rifle Gap	1966
9.	Seedskadee	Wyoming	Fontenelle	1968
---	*Central Utah (Bonneville Unit)	Utah	Starvation	1970
10.	Bostwick Park	Colorado	Silver Jack	1971
11.	Lyman	Utah and Wyoming	Meeks Cabin	1971
12.	San Juan-Chama	Colorado and New Mexico	Heron	1971
---	*Central Utah (Bonneville Unit)	Utah	Soldier Creek	1973
---	*Central Utah (Bonneville Unit)	Utah	Currant Creek	1975
---	Lyman	Utah and Wyoming	Stateline	1979
---	*Central Utah (Jensen Unit)	Utah	Red Fleet	1980
---	*Central Utah (Bonneville Unit)	Utah	Upper Stillwater	1987
13.	Dallas Creek	Colorado	Ridgway	1991
---	*Central Utah (Bonneville Unit)	Utah	Jordanelle	1993
14.	Dolores	Colorado	McPhee	1998
15.	*Animas-La Plata	Colorado and New Mexico	Ridges Basin	2011
16.	*Navajo Indian Irrigation	New Mexico	---	Under Construction

17.	*Navajo-Gallup Water Supply	New Mexico	---	Under Construction
*In the process of completion.				

The present status of construction, investigation, and recreational facilities for the 23 authorized CRSP participating projects is as follows:

Colorado

Bostwick Park Project

The Bostwick Park Project is located in west-central Colorado near the city of Montrose. The project develops flows of Cimarron Creek, a tributary of the Gunnison River, for irrigation and for benefits to sport fishing and recreation. A full and supplemental supply of irrigation water is available for 6,100 acres of land. Silver Jack Dam (completed in 1971) is located on Cimarron Creek about 20 miles above the junction with the Gunnison River. Project water stored in Silver Jack Reservoir is released to Cimarron Creek. The releases, along with usable natural flows, are diverted from the creek into the existing Cimarron Canal 2.5 miles below the dam and conveyed 23 miles to the vicinity of the project land. The U.S. Forest Service developed recreation facilities under a cooperative arrangement with Reclamation. Facilities include access roads, campgrounds (60 units in three loops), two group areas, picnicking facilities, restrooms, a boat dock, trails, fences, landscaping, and an administration site. At 8,900 feet in elevation, use is seasonal. The reservoir is managed as a non-motorized boating lake with three species of trout. Access for anglers is fairly easy at designated access points around the 293-acre reservoir.

Dallas Creek Project

The Dallas Creek Project is located on the Uncompahgre River in west-central Colorado. The area served by the project comprises most of the Uncompahgre River Basin and includes lands in Montrose, Delta, and Ouray counties. Ridgway Dam and Reservoir, the primary features of the project, are located on the Uncompahgre River a few miles north of the town of Ridgway.

Block notice number one was issued for the Dallas Creek Project on May 31, 1989, covering all municipal and industrial water use. The notice involved 28,100 acre-feet of water. Repayment on that notice began in 1990. Block notice number two was issued on March 21, 1990. The notice included all irrigation waters for the project, involving 11,200 acre-feet. The notice was issued to Tri-County Water Conservancy District. The first payment under the repayment contract was made in February 1993 and will continue until February 2042.

A 40-year lease of power privilege between Tri-County Water Conservation District and the United States was signed on February 6, 2012, allowing for the

construction and operation of a hydropower facility with a capacity of seven MWs, generating approximately 22,000 Megawatt hours per year. Construction of the hydropower facility was completed in early 2014 and operation of the powerplant began in April 2014.

Recreation at Ridgway Reservoir is managed by CPW under an agreement with Reclamation. There are numerous picnicking and campsites available including miles of trails around the reservoir and downstream of Ridgway Dam. The park has become so popular that all of the campsites were put on a reservation system beginning with the 2019 recreation season. Reclamation and Ridgway State Park have implemented a seasonal closure of the area east of Highway 550 to public access to protect wintering big game. Fishing at Ridgway is considered to be good and CPW, in an effort to protect native fish downstream, encourages anglers to catch as many smallmouth bass as they can since the species was illegally stocked in the early 2000s.

Reclamation is working closely with CPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. CPW is conducting mandatory boat inspections and decontaminations at Ridgway and boat ramps are closed to trailered boats at the end of September of each year. Reclamation and CPW designed a permanent boat inspection and decontamination area at the reservoir. However, construction contract bids were over budget, so the project was not awarded cancelled in 2018. WCAO has revisited their plans for ANS at Ridgway State Park, and CPW has identified a different location for the inspection and decontamination station, by their current station near the boat ramp. Reclamation engineers and surveyors are creating a new design for this station in 2020 and 2021. CPW plans to replace their standard hot water decontamination units with on-demand hot water units in 2021 and is installing additional propane and electricity at the site to accommodate the on-demand units. These units will be more consistent and reliable in supplying the needed hot water to the units.

Dolores Project

The Dolores Project, located in the Dolores and San Juan River basins in southwestern Colorado, uses water from the Dolores River for irrigation, municipal and industrial use, recreation, fish and wildlife, and production of hydroelectric power. Primary storage of Dolores River flows for all project purposes is provided by McPhee Reservoir, formed by McPhee Dam and Great Cut Dike. Dolores Project construction began in 1976. By fiscal year 1995, all primary project facilities were completed and in operation. In 1996, Reclamation signed petitions allocating the last approximately 1,800 acre-feet of full-service irrigation water to full-service users. Reclamation substantially completed construction of the Dolores Project in fiscal year 1998. The final cost allocation for the project was completed in October 2000 and approved by the Upper Colorado Basin Regional Director by memorandum dated January 25, 2001.

In order to mitigate construction of salinity control modifications to the Upper Hermana, Lone Pine, and Rocky Ford Laterals (parts of the Dolores Project), 55 acres of new wetlands were developed at the Lone Dome wetlands area below McPhee Dam. In order to complete the remaining 20 acres of mitigation, Reclamation developed Simon Draw wetlands near the Totten Reservoir area. A long-term management agreement between Reclamation and CPW for operation and maintenance of the Lone Dome wetlands area is in place. Reclamation's Western Colorado Area Office operates and maintains Simon Draw wetlands.
Hydroelectric power generation is a component of the Dolores Project with McPhee and Towaoc Canal powerplants. McPhee Powerplant is located at the downstream toe of McPhee Dam along the left abutment with an installed capacity of 1.3 MWs. Towaoc Canal Powerplant is located on the Towaoc Canal, five miles north of Cortez, Colorado, in Montezuma County with an installed capacity of 11.5 MWs.

Recreation at McPhee Reservoir is under the jurisdiction of the U.S. Forest Service through an agreement with Reclamation, and through legislation that expanded the boundary of the San Juan National Forest to include the reservoir. The reservoir has 50 miles of shoreline and two recreation complexes with campgrounds, day-use areas, and boat launch ramps. There is also a marina concession to serve visitors. Montezuma County is exploring the potential for legislation to transfer title of the recreation areas at McPhee Reservoir to the county.

The Lone Dome Recreation Area is located below McPhee Dam and includes twelve miles of public access to the Dolores River. This area is comprised of lands administered by the U.S. Forest Service, Bureau of Land Management (BLM), and CPW.

Reclamation is working closely with partners including the Dolores Water Conservancy District, CPW, and the Forest Service and was able to institute a funding agreement for boat inspections and a decontamination program to prevent invasive mussels from invading the reservoir. Because of the reservoir's proximity to Lake Powell, boat launch ramp closure hours were implemented in 2017 and locked gates were installed for times when boat inspections were not available.

Florida Project

Lemon Dam is the principal feature of the Florida Project. The dam, completed in 1963, is located in southwestern Colorado on the Florida River, approximately fourteen miles northeast of the City of Durango in La Plata County. Flows in the Florida River are stored in the reservoir formed by the dam, and regulated releases can provide supplemental irrigation water for 19,450 acres. In addition to the construction of Lemon Dam, Reclamation work included rebuilding the Florida Farmers Diversion Dam, enlarging 3.9 miles of the Florida Farmers Ditch to its

junction with the Florida Canal, enlarging 1.8 miles of the Florida Canal, and building a new lateral system to serve about 3,360 acres of land on the southwest portion of Florida Mesa. Project funds were advanced to the Florida Water Conservancy District to rehabilitate, enlarge, and extend portions of the Florida Farmers Ditch and Florida Canal distribution systems that serve remaining lands on Florida Mesa. The 1,190 acres of project land located in the Florida River Valley will continue to be served by numerous small ditches without the expenditure of project funds.

Lemon Powerplant, completed in 1989, has a capacity of 0.12 MWs. The powerplant was constructed and is operated by the Florida Water Conservancy District under a lease of power privilege contract.

A conversion contract for 2,500 acre-feet of Florida Project water to be available for municipal and industrial purposes was negotiated and executed in early 2014. A similar contract for 114 acre-feet was executed in 2009, which made water originally tied to the land inundated by the reservoir available for augmentation purposes.

Lemon Reservoir provides important recreation and fish and wildlife benefits; however, its primary purpose is to provide irrigation water and flood control. Recreation at Lemon Reservoir is under the jurisdiction of the U.S. Forest Service through an agreement with Reclamation. This is a high-elevation reservoir (8,500 feet) with seasonal use. The Miller Creek Campground has twelve campsites, restrooms, potable water, boat launch ramp and parking area, and a day-use picnic area The Upper Lemon Day-Use Area provides access for fishing and hiking and includes restrooms and a parking area.

Reclamation partnered with the U.S. Forest Service, La Plata County, and the Florida Water Conservancy District to close the boat ramp at Lemon Reservoir to motorized boating from 2017 through 2019. The Forest Service received no complaints regarding the closure in 2017. Design and construction of boat inspection and decontamination facilities at the reservoir is currently on hold and may not be needed. The reservoir remains open to non-motorized boats. Reclamation and the Florida Water District recently sent a joint letter to the U.S. Forest Service to begin the process of making the closure permanent, beginning in fiscal year 2020.

Fruitland Mesa Project

The Fruitland Mesa Project was found to be infeasible and was not constructed.

Paonia Project

The Paonia Project, located in west-central Colorado, provides full and supplemental irrigation water supplies for 15,300 acres of land in the vicinity of Paonia and Hotchkiss. Project construction includes Paonia Dam and Reservoir and

enlargement and extension of Fire Mountain Canal. Paonia Dam controls and regulates the runoff of Muddy Creek, a tributary of the North Fork of the Gunnison River.

Recreation at Paonia Reservoir is managed by CPS under an agreement with Reclamation. The original recreation facilities were built in 1963 and CPW assumed management in 1965. There are two campgrounds, a picnic area, and boat launching facilities. Recreational attractions include the landscape surrounding the park, waterskiing, camping, and northern pike fishing.

Reclamation is working closely with CPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. Funded through a 50/50 cost share agreement between CPW and Reclamation, all motorized and trailered boats are required to be inspected on site for ANS and decontamination, if necessary, before launching from the boat ramp.

San Miguel Project

The San Miguel Project was found to be economically unjustified and was not constructed.

Silt Project

The Silt Project is located in west-central Colorado near the towns of Rifle and Silt. The project stores the flows of Rifle Creek and pumps water from the Colorado River to supply irrigation water for approximately 7,000 acres of land. Principal features of the project are Rifle Gap Dam and Reservoir, a pumping plant, and a lateral system.

Recreation at Rifle Gap Reservoir is managed by CPW under an agreement with Reclamation. Recreation facilities include numerous campgrounds, picnic sites, a boat ramp, group use area, restrooms, and parking areas. Recreation activities include motorized water sports, swimming, sailing, windsurfing, and fishing. Although Rifle Gap is a small reservoir, it is a popular one with five camp loops and 89 campsites; several campsites are accessible to persons with disabilities.

Reclamation is working closely with CPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. Funded through a 50/50 cost share agreement between CPW and Reclamation, all motorized and trailered boats are required to be inspected on site for ANS and decontamination, if necessary, before launching from the boat ramp.

Smith Fork Project

The Smith Fork Project, located about 30 miles southeast of Delta, Colorado, supplements the irrigation water supply for approximately 8,200 acres in Delta and

Montrose counties and provides a full water supply for 1,423 acres of land previously not irrigated. Constructed features of the project include Crawford Dam and Reservoir, Smith Fork Diversion Dam, Smith Fork Feeder Canal, Aspen Canal, Clipper Canal, and recreation facilities. Recreation at Crawford Reservoir is managed by CPW under an agreement with Reclamation. Boating, scuba diving, water skiing, jet skiing, windsurfing, swimming, fishing, and camping are some of the offerings at the park. There are two campgrounds with 66 sites, a group day-use area, and 30 sites for day use; several campsites are accessible to persons with disabilities.

Reclamation is working closely with CPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures.

West Divide Project

The West Divide Project was found to be economically unjustified and was not constructed.

New Mexico

Hammond Project

The Hammond Project is located in northwestern New Mexico along the southern bank of the San Juan River and opposite the towns of Blanco, Bloomfield, and Farmington, New Mexico. The project provides an irrigation supply for 3,933 acres. Major project works consist of the Hammond Diversion Dam on the San Juan River (completed in 1962), the Main Gravity Canal, a hydraulic-turbine-driven pumping plant and an auxiliary pumping plant, three major laterals, minor distribution laterals, and the drainage system. Most of the irrigation supply is obtained from direct diversions of the natural streamflow of the San Juan River. When necessary, these flows are supplemented by storage releases from Navajo Reservoir, a major feature of the CRSP. Water is diverted from the river by the Hammond Diversion Dam and turned into the 27.4-mile-long Main Canal. Major diversions from the canal are made by the East and West Highline laterals, which are served by the Hammond Pumping Plant, and the Gravity Extension lateral. Small diversions are made by minor laterals.

Navajo-Gallup Water Supply Project

The Navajo-Gallup Water Supply Project was authorized for construction by the Omnibus Public Land Management Act of 2009 (P.L. 111-11) and is the cornerstone of the Navajo Nation water rights settlement in the San Juan River Basin in New Mexico. Construction on the project began in 2012. When completed, the Navajo-Gallup Water Supply Project will consist of two water treatment plants, 300 miles of pipeline, 19 pumping plants, and numerous water regulation and storage facilities. The project will convey a reliable municipal and industrial water supply to the eastern section of the Navajo Nation; the southwestern part of the Jicarilla

Apache Nation; and the City of Gallup, New Mexico, from diversions from the San Juan River Basin in northern New Mexico and via two separate pipeline laterals – the San Juan Lateral (SJL) and the Cutter Lateral. The project will provide a treated water supply designed to serve the region based on a 40-year population projection.

Reclamation is the lead agency in the design and construction of the project, but in order to help meet the Congressionally-mandated completion date of 2024, the Navajo Nation, the City of Gallup, and the Indian Health Service will also be responsible for design and construction of certain features of the project via financial assistance agreements with Reclamation.

Construction of the project is well underway. Fiscal Year 2020 activities included awarding a new contract in the amount of $45.9 million for the construction of Pumping Plants 4 and 7 on the SJL. Construction of two sections (Block 9-11 and Block 4c-8 each approximately 30 miles long) also continued on the SJL. In addition, a major milestone was achieved in October 2020, when the first water deliveries from the Cutter Lateral Water Treatment Plant on the Cutter Lateral were initiated. It is anticipated that by summer of 2021, seven public water systems will be receiving Project water from Cutter Lateral. The project is currently scheduled to be completed in 2027/2028. In 2021, Reclamation anticipates transferring the operation, maintenance, and replacement (OM&R) responsibility of the Cutter Lateral to the Navajo Tribal Utility Authority, awarding contracts for continued pipeline construction on the Navajo Code Talkers Sublateral, continuing construction of the features awarded in previous years, and continuing design work, right-of-way acquisition, and environmental permitting on the remaining SJL features. The project authorization ceiling at the October 2020 price level is $1.348 billion.

Figure 10. Navajo-Gallup Water Supply Project - Aerial image of the Cutter Lateral Water

Treatment Plant which began delivering drinking water to Navajo communities in October 2020.

Navajo Indian Irrigation Project

The Navajo Indian Irrigation Project (NIIP) was authorized in 1962 by P.L. 87-483, with amendments, to develop the necessary infrastructure to deliver San Juan River water to not more than 110,630 acres of farmland in the northeastern part of the Navajo Reservation near Farmington, New Mexico. In a 1962 Memorandum of Agreement, which defined the roles and responsibilities of the Bureau of Indian Affairs (BIA) and Reclamation, the BIA was required to provide funding from its budget appropriation and Reclamation was designated to design and construct the project.

The project has been under construction for over 57 years and is now approximately 75% complete with many of the project features now requiring rehabilitation. The primary issue affecting NIIP completion is insufficient construction funding, which has been inconsistent throughout the history of the project and has ranged from a peak of $28.9 million in 1976 to $0 in 1984 and 1986. Funding levels have remained static at approximately $3 million per year since 2011.

In fiscal year 2019, On-Farm Development by BIA has been completed and Block 9, Stage 1, two Pumping Plant and associated laterals are providing project water to approximately 3,600 acres. Reclamation continues technical assistance to the BIA for the operation and maintenance of the Gallegos Pumping Plant. The fiscal year 2021 construction budget will be used to fund work on G7.5LA Pumping Plant ventilation and Power Factor Corrections for Block 4.

Utah

Central Utah Project

The Central Utah Project (CUP), located in the central and east central part of Utah, was constructed in part by Reclamation and is now being completed by the Central Utah Water Conservancy District in Orem, Utah, the local project sponsor, under the authority of the Central Utah Project Completion Act (CUPCA) of 1992. It is the largest water resources development program ever undertaken in the State of Utah. The CUP provides water for irrigation and municipal and industrial uses. Benefits include recreation, fish and wildlife, flood control, water conservation, water quality control, hydropower generation, and area development. The Initial Phase, authorized in 1964, originally consisted of four units: Bonneville, Jensen, Upalco, and Vernal. An Ultimate Phase consisted of the Ute Indian Unit. A sixth unit; the Uintah Unit, was authorized by separate legislation in 1968. The largest of the six units is the Bonneville Unit which involves the diversion of water from the Uintah Basin, a part of the Colorado River Basin, to the Great Basin, with associated resource developments in both basins. The other units – Jensen, Uintah,

Upalco, Ute Indian, and Vernal – were intended to provide for local development in the Uintah Basin. Work on the Uintah and Upalco units was discontinued. The Ute Indian Unit was deauthorized by Congress in the CUPCA.

Bonneville Unit

The completed Bonneville Unit will deliver a permanent supply of 42,000 acre-feet of irrigation water and 157,750 acre-feet of municipal and industrial water. A key feature of the Bonneville Unit is the trans-basin diversion of 101,900 acre-feet (annual average) of water from the Uintah Basin to the Wasatch Front (Utah County cities and the Salt Lake City metropolitan area).

Central Utah Project Completion Act of 1992. Legislation enacted in 1992 (P.L. 102-575, CUPCA), significantly reformed implementation of the CUP. Among many changes, the Act increased the ceiling to allow completion of the Bonneville Unit of the CUP, authorized new portions and deauthorized old portions of the original plan and provided the Ute Indian Rights Settlement. The legislation provides that the project's local sponsor, the Central Utah Water Conservancy District (District), will plan and construct the remaining CUP-Bonneville Unit features; the Utah Reclamation Mitigation and Conservation Commission, an independent federal commission created under CUPCA, will complete the associated fish and wildlife mitigation; the Secretary will oversee implementation of CUPCA; and the District and/or Department of the Interior may contract with Reclamation for technical services. The Department of the Interior's CUPCA Office and the District completed a Definite Plan Report in 2004 that will ensure that the Bonneville Unit is completed under the remaining ceiling.

Utah Lake Drainage Basin Water Delivery System (Utah Lake System). The final component of the Bonneville Unit to be constructed is the Utah Lake System. The Department of the Interior published the Utah Lake System FEIS on September 30, 2004, and on December 22, 2004, the Assistant Secretary for Water and Science signed the ROD. Construction began in 2007 and as of 2020, 37 miles of large diameter pipeline have been constructed with 21 miles remaining to be constructed.

Hydroelectric Power Generation. In 2005, the Department of the Interior selected the District and Heber Light & Power as joint lessees for power development at Jordanelle Dam. Construction of the 12-megawatt facility began in 2006, and the hydropower facility, which has been certified by the Low Impact Hydropower Institute, began generating power on July 1, 2008. The Department of the Interior, the District, Reclamation, and Western Area Power Administration partnered to implement the Olmsted Hydroelectric Powerplant Replacement Project. Completed in September 2018, this project replaced a 100-year-old facility, provides 13 megawatts of capacity, and protects CUP water rights. Two hydroelectric power generation facilities are planned for construction under the Utah Lake System. These facilities will have a combined capacity of 50 megawatts.

Reservoirs and High Mountain Lakes. The Bonneville Unit includes five reservoirs constructed by Reclamation as storage facilities for project irrigation, municipal and industrial storage, and recreational use. The five reservoirs are Jordanelle, Strawberry, Starvation, Currant Creek, and Upper Stillwater. In addition, three high mountain lakes were reconstructed to provide storage in conjunction with the municipal and industrial system.

Jordanelle Reservoir is the newest reservoir with recreation facilities completed in 1998. Recreation and public use are managed by the Utah Division of Parks and Recreation under an agreement with Reclamation. There are two main developed recreation areas: Hailstone and Rock Cliff. Hailstone is a large developed campground and day-use area located on the west side of the reservoir. Rock Cliff is located on the southeast side of the reservoir and offers a quieter experience with walk-in campgrounds. Ross Creek, more primitive in nature, on the northeast end of the lake features access to the perimeter trail, parking lot with vault toilets, and a nonmotorized boat launch for hand-carried craft such as kayaks and canoes. Strawberry Reservoir was enlarged in 1974 under authority of the CRSPA of 1956 (before the enactment of CUPCA). Soldier Creek Dam, completed in 1973, expanded the capacity of Strawberry Reservoir from 283,000 acre-feet to a maximum capacity of 1,106,500 acre-feet and a total surface area of 17,163 acres. The original Strawberry Dam, constructed by Reclamation in 1922, was deliberately breached in 1985. As part of Reclamation's commitment to provide recreation opportunities, new facilities were built. There are four main developed areas: Strawberry Bay, Soldier Creek, Renegade Point, and Aspen Grove. Recreation management is under the jurisdiction of the U.S. Forest Service.

Starvation Reservoir, the first Bonneville Unit facility to be constructed, is a large reservoir on the Strawberry River in the Uintah Basin. The reservoir, filled by surplus winter and spring flows from the Duchesne and Strawberry rivers, is large enough for all water sports, and has a state park with a campground. Starvation State Park was established in 1972, two years after construction of Starvation Dam. Currant Creek Reservoir is a high elevation lake (7,680 feet) with a mixed open and timbered setting. Development began in 1977 with construction of Currant Creek Dam. Currant Creek Reservoir finished filling in 1982. The reservoir shoreline is 85% under the jurisdiction of the U.S. Forest Service while the remaining 15% is private with restricted access. Recreation management at Currant Creek is under the jurisdiction of the U.S. Forest Service, Uinta National Forest.

Upper Stillwater Reservoir is another high mountain reservoir that has one main campground. The reservoir serves as a popular trailhead into the High Uintas Wilderness with the boundary located only one mile north of the dam near the high-water line for the reservoir. Recreation management is under the jurisdiction of the U.S. Forest Service, Ashley National Forest.

The managed recreation season at Upper Stillwater Reservoir is from June through September with high use on holidays and weekends. Boating use is restricted to

non-motorized craft.

Figure 81. Water from the spillway of Upper Stillwater Dam flows from the reservoir and into Rock Creek, 31 miles northwest of Duchesne, Utah. (Reclamation photo.)

High Mountain Lakes include Washington Lake, Trial Lake, and Lost Lake with a total reservoir capacity of 5,788 acre-feet. Located in the Wasatch Cache National Forest, these lakes were reconstructed to provide irrigation water for Summit County, Utah. Recreation at the lakes is managed by the U.S. Forest Service and allows non-motorized boating and fishing. The lakes are at an elevation of over 9,500 feet and are only accessible during the summer months. The CUPCA also authorized the stabilization of additional high mountain lakes. As part of the Uintah Basin Replacement Project, the Utah Reclamation Mitigation and Conservation Commission stabilized 13 lakes. Authorization still remains for additional lake stabilization in the Uinta Mountains.

Jensen Unit

The Jensen Unit in northeastern Utah provides about 5,300 acre-feet of water for municipal and industrial uses and 4,600 acre-feet for irrigation. Key project features include Red Fleet Dam and Reservoir, Tyzack Aqueduct Reach 1, and Tyzack Aqueduct Reach 2. Recreation at Red Fleet is managed by the Utah Division of Parks and Recreation under an agreement with Reclamation.

Uintah and Upalco Units

Section 203(a) of the CUPCA of 1992 provided for the construction of the Uintah Basin Replacement Project in place of the Uintah and Upalco units which had never been constructed. P.L. 107-366, enacted December 19, 2002, deauthorized the Uintah and Upalco units, transferring the unexpended budget authority to units of the CUP for construction of the Uintah Basin Replacement Project, Utah Lake

System, and other CUPCA purposes. The District completed construction of the primary features (including the enlarged Big Sand Wash Dam) of the Uintah Basin Replacement Project. The Big Sand Wash Feeder Diversion Structure and Pipeline was completed in March of 2004. The Big Sand Wash Reservoir enlargement was completed in September 2006 followed by completion of the Big Sand Wash Roosevelt Pipeline in September 2008. In 2020, title to all features of the Uintah Basin Replacement Project was transferred to the Moon Lake Water Users Association under the authority of Title VIII of the John D. Dingell, Jr. Conservation, Management, and Recreation Act (Public Law No: 116-9**).**

Ute Indian Unit

The Ute Indian Unit was deauthorized in 1992 by Section 201(b) of the CUPCA.

Vernal Unit

The Vernal Unit in northeastern Utah supplies supplemental irrigation water to about 14,700 acres and approximately 1,600 acre-feet of municipal and industrial water annually to the communities of Vernal, Naples, and Maeser. Key project features include Steinaker Dam and Reservoir, Fort Thornburgh Diversion Dam, Steinaker Service Canal, and Steinaker Feeder Canal.

Following observed "sloughing" of riprap on the Steinaker Dam face, a Level 1 Emergency Response was issued on September 24, 2014, and subsequently terminated on October 10, 2014. Enhanced monitoring of the dam began immediately upon notification of the sloughing. After extensive study by Reclamation engineers, corrective work on the dam slope began in 2018. Repair work involved replacing the sloughed material and decreasing the slope of the abutment. The reservoir began filling in late spring of 2019 at a controlled rate to allow the contractor to finish the dam embankment earthfill zones and riprap. The contract work was substantially completed on October 9, 2019. The Uintah Water Conservancy District was able to make its full delivery allocation in 2020.

Recreation at Steinaker is managed by the Utah Division of Parks and Recreation under an agreement with Reclamation.

Emery County Project

The Emery Water Conservancy District fully satisfied its repayment obligation to the federal government in 2016. Due to the district's need to finance current and future repair and replacement of certain project facilities, and Reclamation's desire to reduce federal obligations, costs, and liability, the district and Reclamation completed title transfer of the Project Assets to the district on September 18, 2020. Project Assets include the Joe's Valley Dam, Reservoir and outlet works; the Huntington North Dam, Reservoir and outlet works; the Swasey Diversion Dam; the Cottonwood Creek – Huntington Canal, the Huntington North Service Canal, Huntington North Feeder Canal, and any interest in the Upper Lakes Reservoirs. Title Transfer includes federal lands acquired for the project, and water rights

appropriated under state law for the benefit of the project.

Recreation facilities have been constructed at both Joe's Valley and Huntington North reservoirs. Recreation facilities at Joe's Valley are operated by the U.S. Forest Service and recreation at Huntington North is managed by the Utah Division of Parks and Recreation, both now under agreements with the district. Invasive mussels have not been detected in either reservoir.

Wyoming

Eden Project

The Eden Project furnishes an irrigation water supply for 17,010 acres. Project lands are in the vicinity of the towns of Farson and Eden in southwestern Wyoming about 40 miles north of Rock Springs. Project features include Big Sandy Dam and Reservoir, Eden Dam and Reservoir, Little Sandy Feeder Canal, Big Sandy Feeder Canal, Means Canal, Little Sandy Canal, Eden Canal, and three laterals and a drainage system. Big Sandy Dam (completed in 1952) was constructed to replace some storage in the existing off-stream Eden Reservoir and to supply water for additional project lands. The Means Canal conveys water from Big Sandy Reservoir to the Westside Lateral, which serves lands on the west side of Big Sandy Creek, the Farson Lateral, which serves lands on the east side of the creek, and the Eden Canal which supplies the Eden lateral. The Eden Lateral supplies water to lands in Eden. Little Sandy Diversion Dam diverts water into the Little Sandy Feeder Canal. Water can be diverted from Big Sandy Dam to Eden Reservoir through the Big Sandy Feeder Canal. Water is drawn from Eden Reservoir to serve Eden Canal and Farson Lateral.

Reclamation and the Wyoming Water Development Office (WWDO) have moved forward with plans to increase the storage of Big Sandy Reservoir, and as a result, firm up the project water supply. Reclamation's Denver Technical Service Center is finalizing designs needed to raise the top of active conservation 5 feet. Final designs will incorporate a filter diaphragm around the outlet works, additional toe drains at the left abutment, cutoff wall in the dike, a rebuilt diversion in the dike, and replacement of drop structures in the Big Sandy feeder canal, a final environmental assessment and finding of no significant impact was completed in June 2020. A construction contract will be awarded in March 2021 with construction work beginning in fall of 2021.

Recreation facilities at Big Sandy Reservoir are administered by Reclamation's Provo Area Office. In 2010, the Wyoming Game and Fish Commission implemented emergency regulations to stop the spread of aquatic invasive species in Wyoming waters. Under this regulation, all watercraft are required to purchase and display an aquatic invasive species decal. Funds raised from purchase of the decals are used to pay for public education programs and prevention efforts to keep invasive quagga and zebra mussels from being introduced. Efforts include watercraft

inspections, decontamination if warranted, and possible criminal and civil penalties for anyone found violating the regulations. To date, no mussels have been detected in Wyoming waters.

La Barge Project

The La Barge Project was found to be infeasible and was not constructed.

Seedskadee Project

The Seedskadee Project is located in the Upper Green River Basin in southwestern Wyoming. It provides storage and regulation of the flows of the Green River for power generation, municipal and industrial use, fish and wildlife, and recreation. Principal features of the project include Fontenelle Dam, powerplant, and reservoir. The reservoir is operated for municipal and industrial water use, power production, flood control, and the downstream fishery and wildlife refuge.

Fontenelle Reservoir has an active capacity of 150,500 acre-feet and a total capacity of 345,360 acre-feet, with a surface area of 8,058 acres. The lake is 20 miles in length when full and has a shoreline of approximately 56 miles. On October 23, 2018, President Donald Trump signed into law America's Water Infrastructure Act of 2018 (P.L. 115-270). Section 4310 of this bill authorizes Reclamation to plan and construct the Fontenelle Riprap Project, which will expand the yield of Fontenelle Reservoir in Wyoming. The project will allow Wyoming to further develop its apportionment under the Upper Colorado River Basin Compact. Any work related to the expansion of the reservoir will be funded by the State of Wyoming.

Reclamation manages approximately 147,000 acres of withdrawn land adjacent to and downstream of Fontenelle Dam and Reservoir that are no longer needed for project purposes. Reclamation submitted a request to revoke its withdrawal of these lands to the BLM on December 31, 2014. The BLM has reviewed the revocation request and completed field authorizations reviews. A Finding of No Significant Impact was developed and signed, and the completed package sent to the Department of the Interior for review and final approval. The withdrawal was relinquished, and the lands returned to the public domain to be managed by the BLM.

Recreation facilities at Fontenelle Reservoir are managed by the BLM under an agreement with Reclamation. Fontenelle Creek Recreation Area is the only developed site on the reservoir, although there are three other campgrounds (Tailrace, Weeping Rock, and Slate Creek) located below Fontenelle Dam, along the Green River, that are more primitive.

In 2010, the Wyoming Game and Fish Commission implemented emergency regulations to stop the spread of aquatic invasive species in Wyoming waters. Efforts include watercraft inspections, decontamination if warranted, and possible

criminal and civil penalties for anyone found violating the regulations.

The State of Wyoming wishes to contract for additional water from Fontenelle Reservoir. Fontenelle's current active capacity is approximately 264,250 acre-feet of which 139,000 acre-feet is available to Wyoming in addition to 120,000 acre-feet already under contract. Extension of the riprap would increase the active capacity to approximately 344,000 acre-feet adding about 79,750 acre-feet available for contracting. Further analysis is needed to consider potential impacts to operations at lower levels for power generation, instream flows, and water deliveries. Passage of H.R. 648 – 115th Congress, allows the extension of the riprap on the face of the dam to allow the state to contract for all remaining water (less dead storage) in the reservoir. This bill authorized an amendment to Definite Plan Report for the Seedskadee Project to provide for the study, design, planning, and construction activities that will enable the use of all active storage capacity of Fontenelle Dam and Reservoir, including the placement of sufficient riprap on the upstream face of the dam to allow such storage capacity to be used for authorized project purposes. The bill requires the State of Wyoming to provide funds for any work carried out with regards to the additional capacity. The Department of the Interior has recently entered into a Technical Service Agreement with the state for the planning, design, related preconstruction activities such as environmental and cultural resource compliance, and construction of any modification of the Fontenelle Dam.

Colorado and New Mexico

Animas-La Plata Project

The Animas-La Plata Project is located in southwestern Colorado and northwestern New Mexico and was first authorized by the CRBPA of 1968 (P.L. 90-537). In 1988, it was incorporated into the Colorado Ute Indian Water Rights Settlement Act (P.L. 100-585). The Colorado Ute Settlement Act Amendments of 2000 (Title III of P.L. 106-554, December 21, 2000) provide for implementation and completion of the project. Approval to begin construction was granted in October 2001 and initial site work started in April 2002. Construction of Ridges Basin Dam, the Durango Pumping Plant, and Lake Nighthorse (formerly called Ridges Basin Reservoir) will provide the Southern Ute Indian and Ute Mountain Ute Tribes with a reliable water supply for their future needs, while protecting scarce water resources for existing water users in southwestern Colorado and northwestern New Mexico. It remains a priority of the Secretary to complete the Animas-La Plata Project in a cost effective and efficient manner.

The Animas-La Plata Project consists of four major components: Ridges Basin Dam, Durango Pumping Plant, and Ridges Basin Inlet Conduit located in Colorado; and the Navajo Nation Municipal Pipeline (NNMP) located in New Mexico. The NNMP consists of approximately 30 miles of 24-inch diameter pipeline running from Farmington, New Mexico, to Shiprock, New Mexico, and will provide for the

conveyance of 4,680 acre-feet of municipal water per year to Navajo Nation communities. The project consists of various other elements including multiple utility and road relocations; fish, wildlife, and wetlands mitigation; a permanent operating facility; and cultural resources investigations. The reservoir formed by Ridges Basin Dam was named Lake Nighthorse in honor of Senator Ben Nighthorse Campbell who played an instrumental role in the Colorado Ute Settlement and construction of the Animas-La Plata Project.

All Colorado features of the Animas-La Plata project are currently operational. In August 2012, water was released from Lake Nighthorse down Basin Creek to successfully test the Basin Creek features. An operation and maintenance contract has been signed with the Animas-La Plata Operations, Maintenance and Replacement Association (ALP OM&R Association) that allows project sponsors to operate Colorado project features. Transfer of OM&R responsibilities to the ALP OM&R Association occurred on April 1, 2013. Lake Nighthorse began filling on May 4, 2009 and filled for the first time on June 29, 2011. The maximum water surface elevation of 6,882 feet equates to 123,541 acre-feet in storage and a water surface area of approximately 1,500 acres.

In New Mexico, completion of the NNMP has been delayed due to damages caused by a landslide.

Lake Nighthorse opened to recreation in the spring of 2018. The recreation area is managed by the City of Durango. Recreation opportunities at Lake Nighthorse include swimming, boating, fishing, and picnicking. Motorized use is allowed from May 15 to November 15. All motorized boats are inspected for invasive species and are subject to decontamination before entering the water.

To protect cultural resources in the area, recreation is only allowed in developed areas and 25 feet above the high-water level around the reservoir. Land around Lake Nighthorse that is off-limits to recreation has been posted with no trespass signs and all visitors receive a brochure with rules for recreating at the lake. Destruction or removal of cultural resources will be prosecuted. Reclamation will continue to work with all partners and stakeholders regarding recreation management at Lake Nighthorse.

Pine River Extension Project

The Pine River Extension Project was found to be infeasible and was deleted in the 1968 CRBPA.

San Juan-Chama Project

The San Juan-Chama Project consists of a system of diversion structures and tunnels for transmountain movement of water from the San Juan River Basin to the Rio Grande Basin. Primary purposes of the San Juan-Chama Project are to furnish a water supply to the middle Rio Grande Valley for municipal, domestic,

and industrial uses. The project is also authorized to provide supplemental irrigation water and incidental recreation and fish and wildlife benefits. The regulating and storage reservoir is formed by Heron Dam on Willow Creek just above the point where Willow Creek enters the Rio Chama. Heron Reservoir is operated by Reclamation in compliance with applicable federal and state laws including the San Juan-Chama Project authorization and the Rio Grande and Colorado compacts. Under these laws, only imported San Juan-Chama Project water may be stored in Heron Reservoir; there are no provisions for storing native Rio Grande water.

The Pojoaque Irrigation Unit, made up of Nambe Falls Dam and storage reservoir, provides supplemental irrigation water for about 2,800 acres in the Pojoaque Valley. It serves the Pojoaque Valley Irrigation District and the Indian pueblos of San Ildefonso, Nambe, and Pojoaque.

Reclamation, in coordination with the Western Area Power Administration, is considering hydroelectric power development on the San Juan-Chama Project under a lease of power privilege at up to four conduit drops along the project. Reclamation selected the Albuquerque Bernalillo County Water Utility Authority as the preliminary lessee and is working to execute a preliminary lease and funding agreement for the development of non-federal hydropower on the project.

Recreation at Heron Reservoir is managed by New Mexico State Parks under an agreement with Reclamation. Recreation at Nambe Falls Reservoir is managed by the Nambe Pueblo under an agreement with Reclamation.

In April 2009, New Mexico's governor signed the Aquatic Invasive Species Control Act. The Act allows the New Mexico Department of Game and Fish to take actions to protect New Mexico's waters from the negative impacts of aquatic invasive species. To date, no evidence of invasive mussels has been found at Heron Reservoir. The Pojoaque Pueblo does not have an active mussel inspection program; therefore, the status of Nambe Falls reservoir is unknown at this time.

Colorado and Wyoming

Savery-Pot Hook Project

The Savery-Pot Hook Project was found to be infeasible and was not constructed.

Utah and Wyoming

Lyman Project

The Lyman Project lands are in southwestern Wyoming; however, much of the drainage area and one storage feature are in Utah, just across the Utah-Wyoming state line. The Lyman Project includes Meeks Cabin Dam and Reservoir and Stateline Dam and Reservoir. The project regulates the flows of Blacks Fork and the

east fork of Smiths Fork for irrigation, municipal and industrial use, fish and wildlife conservation, and recreation. Recreation at Meeks Cabin and Stateline dams and reservoirs is the responsibility of the U.S. Forest Service, Wasatch-Cache National Forest, under authority of P.L. 89-72, as amended.

RECREATIONAL USE AT RESERVOIRS

CRSP facilities provide a kaleidoscope of scenic and recreational opportunities that have significant economic benefits. While exact use figures are not available, it is estimated that recreation visits to CRSP initial facilities totaled around 4.9 million for fiscal year 2020, demonstrating the high value placed on outdoor recreation opportunities in the Intermountain West. Recreation use at participating projects increased that number to about 7 million. Recreation at CRSP facilities is a strong economic driver in the affected states, with some smaller and more rural areas being almost entirely dependent upon the dollars that recreation brings to their communities.

For detailed information concerning recreational opportunities at CRSP and participating project reservoirs, please visit the following website: https://www.recreation.gov.

OTHER RECLAMATION PROJECTS IN THE UPPER COLORADO RIVER BASIN

Significant Reclamation projects in the Upper Colorado River Basin that either use water from the Colorado River or are transbasin water diversion projects are discussed below. While these projects are not part of the CRSP, they are worth noting.

Colorado

Colorado-Big Thompson Project

The Colorado-Big Thompson Project is a multipurpose transmountain, transbasin water diversion and delivery project located in Colorado. The project stores, regulates, and diverts water from the Colorado River west of the Rocky Mountains, providing supplemental water for irrigation of 640,000 acres of land east of the Rocky Mountains. The project historically diverts 230,000 acre-feet annually from the headwaters of the Colorado River with a maximum possible diversion of 310,000 acre-feet. The Northern Water Conservancy District apportions the water diverted from the West Slope, which is used for irrigation in more than 120 ditches and 60 reservoirs. Besides irrigation water uses, the project also provides water for industrial, hydroelectric power, recreation, and environmental uses for a growing population of approximately 960,000.

Although the Colorado-Big Thompson Project is not a participating project of the CRSP, it does utilize water diverted from the Upper Colorado River system to the

eastern slope of Colorado.

Colorado-Big Thompson Project storage as of September 30, 2020, was at 79% of capacity. Storage reservoir volumes were as follows:

- West Slope - Lake Granby, 475,524 acre-feet
- Grand Lake, 719 acre-feet
- Shadow Mountain, 16,663 acre-feet
- Willow Creek, 9,545 acre-feet
- Green Mountain, 95,876 acre-feet
- East Slope - Carter Lake, 85,432 acre-feet, and
- Horsetooth, 75,951 acre-feet

During water year 2020, transmountain diversions from the Colorado River Basin in Colorado by the Colorado-Big Thompson Project via the Adams Tunnel totaled 210,954 acre-feet.

Fryingpan-Arkansas Project

The Fryingpan-Arkansas Project is a multipurpose transmountain, transbasin water diversion and delivery project located in Colorado. It was designed for an average annual diversion of 69,200 acre-feet of surplus water from the Fryingpan River and other tributaries of the Roaring Fork River, on the western slope of the Rocky Mountains, to the Arkansas River Basin on the eastern slope. The historical average imports are 54,000 acre-feet. The Fryingpan-Arkansas Project originally provided a supplemental supply of irrigation water for 280,600 acres of farmland and currently provides a supplemental supply of water for 200,000 acres in the Arkansas Valley. Total project supplies may be further increased through use and reuse of project water.

Although the Fryingpan-Arkansas Project is not a participating project of the CRSP, it does utilize water diverted from the Upper Colorado River system to the eastern slope of Colorado.

Fryingpan-Arkansas Project storage as of September 30, 2020, was at 99% of capacity, excluding Pueblo Reservoir flood storage. Storage reservoir volumes were as follows:

- West Slope - Ruedi Reservoir, 70,686 acre-feet
- East Slope - Turquoise Lake, 94.026 acre-feet
- Combined Mt. Elbert Forebay and Twin Lakes Reservoir, 102,976 acre-feet, and
- Pueblo Reservoir, 180,328 acre-feet

During water year 2020, transmountain diversions from the Colorado River Basin in Colorado by the Fryingpan-Arkansas Project via the Charles H. Boustead Tunnel totaled 53,241 acre-feet.

Uncompahgre Project

The Uncompahgre Project is located on the western slope of the Rocky Mountains in west-central Colorado. Project lands surround the town of Montrose and extend 34 miles along both sides of the Uncompahgre River to Delta, Colorado. Project features include Taylor Park Dam and Reservoir, the Gunnison Tunnel, seven diversion dams, 128 miles of main canals, 438 miles of laterals, and 216 miles of drains. The systems divert water from the Uncompahgre and Gunnison rivers to serve over 76,000 acres of project land. Project water released from Taylor Park Reservoir passes through the Aspinall Unit, one of the four initial storage units of the CRSP, before it is diverted through the Gunnison Tunnel into the Uncompahgre Valley

PLANNING INVESTIGATION ACTIVITIES

The Upper Colorado Basin General Planning Activities (GPA) budget for fiscal year 2020 was $641,000. The GPA program focuses on planning activities that cross regional boundaries and includes Reclamation-wide planning tasks, unanticipated short-term studies, work related to interstate and international agreements, technical assistance to states and tribes, and other environmental and interagency coordination activities. GPA activities are not funded by any other projects or planning programs such as Reclamation's WaterSMART (Sustain and Manage America's Resources for Tomorrow) programs, including: Baseline Assessments (BAs), Reservoir Operations Pilots (ROPs), Applied Science Grants (ASGs), Basin Studies, Water Operation Pilots (WOPs), Water Marketing Strategy Grants (WMSG), Drought Response, Title XVI Water Reclamation and Reuse, Water Conservation Field Services (WCFS), and Cooperative Watershed Management (CWM).

Reclamation conducts BAs to develop water supply and demand information, guidance, and tools needed to conduct planning activities across Reclamation's mission areas. The ROPs conducts pilot studies to identify possible improvements to reservoir operations by incorporating improved scientific information and enhancing operational flexibility to maximize benefits from the existing system. The ASGs develop hydrologic information and water management tools and improve modeling and forecasting capabilities. Basin Studies are collaborative studies, cost-shared with non-federal partners, to evaluate water supply and demand and help ensure reliable water supplies by identifying strategies to address imbalances in water supply and demand. WOPs allow entities that have completed a basin study to build on the analyses and strategies developed in the basin study.

The WMSG provides grants to conduct planning activities in developing a water marketing strategy that establish or expand water marketing activities between willing participants, in compliance with state and federal laws. The Drought Response Program provides assistance to develop a drought contingency plan or to update an existing plan to meet the required elements described in the Drought

Response Framework to build long-term resiliency to drought. The Title XVI Water Reclamation and Reuse Program focuses on identifying and investigating opportunities to reclaim and reuse wastewater and naturally impaired ground and surface water. The WCFS Program provides technical assistance, assists with the development of water conservation plans, identify water management improvements, and improve application of water conservation technologies through demonstration activities. The CWM Program Phase I provides funding for watershed group development, watershed restoration planning, and watershed management project design.

RESERVOIR OPERATIONS

Each year Reclamation prepares the Annual Operating Plan (AOP) for Colorado River reservoirs. The purpose of the AOP is to report on past year's operations and illustrate the potential range of reservoir operations that might be expected in the upcoming water year. Information from the 2021 AOP is summarized below.

For a detailed discussion of reservoir operations in 2020 and the range of probable projected 2021 operations for each of the four main storage units of the CRSP, please visit the 2021 AOP webpage to view it in its entirety[10].

2020 Hydrology Summary and Reservoir Status

Below average streamflows were observed throughout much of the Colorado River Basin during water year 2020. Unregulated inflow to Lake Powell in water year 2020 was 5.85 million acre-feet (maf), or 54% of the 30-year average, which is 10.83 maf. Unregulated inflow to Flaming Gorge, Blue Mesa, and Navajo Reservoirs was 86%, 64%, and 40% of average, respectively.

Precipitation in the Upper Colorado River Basin was below average during water year 2020. On September 30, 2020, the cumulative precipitation received within the Upper Colorado River Basin for water year 2020 was 77% of average.

Snowpack conditions trended near average across most of the Colorado River Basin throughout the snow accumulation season. The basin-wide snow water equivalent measured 107% of average on April 1, 2020, which is the same date as the seasonal accumulation peak. On April 1, 2020, the snow water equivalents for the Green River, Upper Colorado River Headwaters, and San Juan River Basins were 110%, 115%, and 96% of average, respectively.

During the 2020 spring runoff period, inflows to Lake Powell peaked on June 5, 2020, at approximately 42,500 cubic feet per second. The April through July unregulated inflow volume for Lake Powell was 3.76 maf, which was 52% of average.

[10] U.S. Bureau of Reclamation Website. Webpage: https://www.usbr.gov/uc/water/rsvrs/ops/aop/. Accessed on March 29, 2021.

The Colorado River total system storage experienced a net decrease of 2.76 maf in water year 2020. Reservoir storage in Lake Powell decreased during water year 2020 by 1.91 maf. Reservoir storage in Lake Mead increased during water year 2020 by 0.018 maf. At the beginning of water year 2020 (October 1, 2019), Colorado River total system storage was 53% of capacity. As of September 30, 2020, the end of water year 2020, total system storage was 48% of capacity, the lowest system capacity on record.

System Conservation

During ongoing drought in the Colorado River Basin, storage in Colorado River system reservoirs has declined from nearly full to less than half of capacity. Entities that rely on Colorado River water were concerned with the extended drought and declining reservoir levels at Lake Powell and Lake Mead. In response, several programs were implemented to test approaches that might help mitigate the impacts of the drought.

In 2013, a pilot fallowing program agreement was executed between the Central Arizona Water Conservation District (CAWCD), through the Central Arizona Groundwater Replenishment District, and the Yuma Mesa Irrigation and Drainage District. The water that was conserved under this program during 2014 through 2016 will remain in Lake Mead as system water.

In 2014, an $11 million funding agreement to establish a pilot program for the creation of Colorado River system water (known as the System Conservation Pilot Program or SCPP in the Upper Basin) was executed among Reclamation, the CAWCD, Metropolitan Water District of Southern California (MWD), Denver Water, and Southern Nevada Water Authority (SNWA) (the Funding Partners). The funding agreement established the SCPP for to test the potential for creation of Colorado River system water through voluntary, compensated, temporary water conservation actions and reductions in water use beginning in 2015.

The purpose of the pilot program was to explore and learn about the effectiveness of voluntary, temporary, compensated measures that could be used, when needed, to help maintain water levels in Lakes Powell and Mead above critical levels. All water conserved as a result of the pilot program was considered Colorado River system water. To facilitate administration and implementation of the System Conservation Pilot Program in the Upper Basin, the Upper Colorado River Commission (UCRC) and the Funding Partners entered into a facilitation agreement in May 2015 clarifying how the program would be administered by the UCRC in the Upper Basin. The program was funded and extended for a fourth year into 2018, when it was discontinued by the UCRC.

Over the four-year life of the System Conservation Pilot Program, 64 projects were implemented in the Upper Basin, resulting in approximately 47,100 acre-feet of

system water created, and 11 projects were implemented in the Lower Basin, resulting in approximately 147,000 acre-feet of system water created. In June 2018, the UCRC passed a resolution to cease acting as the contracting entity for the System Conservation Pilot Program in the Upper Basin (after fulfilling its commitments for 2018) in favor of focusing its efforts on investigating outstanding considerations related to demand management.

In addition to the above activities, Reclamation, CAWCD, MWD, SNWA, and the Lower Division States signed a Memorandum of Understanding in December 2014 to use best efforts to implement further voluntary measures designed to add to storage in Lake Mead. Furthermore, Congress has provided authorization for additional funding through Reclamation for drought-related activities to increase Colorado River system water in Lake Powell, Lake Mead, and other Colorado River system reservoirs for the benefit of the system. Reclamation will send a report to Congress evaluating the effectiveness of the water conservation pilot projects, including a recommendation on whether activities undertaken by the pilot projects should be continued.

Projected Upper Basin Delivery for 2021

Taking into account the existing water storage conditions in the Upper Basin, the August 2020 24-Month Study projection of the most probable near-term water supply conditions in the Upper Basin, and Section 6.B of the 2007 Interim Guidelines for the Coordinated Operations of Lake Powell and Lake Mead, the Upper Elevation Balancing Tier will govern the operation of Lake Powell for water year 2021. The August 2020 24-Month Study of the most probable inflow scenario projects the water year 2020 release from Glen Canyon Dam to be 8.23 maf. Given the hydrologic variability of the Colorado River System and based on actual 2021 water year operations, the projected water year release from Lake Powell in 2021 will likely be 8.23 maf under the most likely range of inflow scenarios forecasted for water year 2021. However, releases could range anywhere between 8.23 maf to greater than 9.0 maf depending on actual hydrological conditions.

Summary of Reservoir Operations in 2020 and Projected 2021 Reservoir Operations

The operation of Colorado River reservoirs has affected some aquatic and riparian resources. Controlled releases from dams have modified temperature, sediment load, and flow patterns, resulting in increased productivity of some riparian and non-native aquatic resources and the development of economically significant sport fisheries. However, these same releases can have detrimental effects on endangered and other native species. Operating strategies designed to protect and enhance aquatic and riparian resources have been established after appropriate NEPA compliance at several locations in the Colorado River Basin.

In the Upper Basin, public stakeholder work groups have been established at Fontenelle Dam, Flaming Gorge Dam, the Aspinall Unit, and Navajo Dam. These

work groups provide a public forum for dissemination of information regarding ongoing and projected reservoir operations throughout the year and allow stakeholders the opportunity to provide information and feedback with respect to ongoing reservoir operations. Additionally, the Glen Canyon Dam AMWG was established in 1997 as a chartered committee under the Federal Advisory Committee Act of 1972.

Modifications to projected operations are routinely made based on changes in forecasted conditions or other relevant factors. Within the parameters set forth in the Law of the River and consistent with the Upper Colorado Recovery Program, the San Juan River Basin Recovery Implementation Program (San Juan Recovery Program), Section 7 consultations under the ESA, and other downstream concerns, modifications to projected monthly operations may be based on other factors in addition to changes in streamflow forecasts. Decisions on spring peak releases and downstream habitat target flows may be made midway through the runoff season. Reclamation will conduct meetings with Recovery Program participants, the U.S. Fish and Wildlife Service, other federal agencies, representatives of the Basin states, and with public stakeholder work groups to facilitate the discussions necessary to finalize site-specific projected operations.

FISH AND WILDLIFE

During the 1960s and 1970s, growing public concern over the environment resulted in new federal environmental laws. The enactment of the CRBPA of 1968, NEPA of 1969, ESA of 1973, and GCPA of 1992 has resulted in new compliance requirements as well as authorization in some cases for CRSP units to modify operations for fish and wildlife and other environmental protection purposes. Additionally, the Reclamation Projects Authorization and Adjustment Act, signed October 30, 1992 (P.L. 102-575), was authorized to protect, restore, and enhance wetland and upland ecosystems for the conservation of fish and wildlife resources in the Upper Colorado River Basin, including fish and wildlife resources adversely affected by construction and operation of the CRSP.

Since its inception in 1956, the CRSP has grown to include the participation of two significant endangered fish Recovery Programs: the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program.

The Upper Colorado Recovery Program, established in 1988, is a cooperative effort among the states of Colorado, Utah, and Wyoming; representatives from the water development, hydroelectric consumer, and environmental communities; and affected federal agencies including Reclamation, the NPS, U.S. Fish and Wildlife Service, and Western Area Power Administration. The intent of the program is to recover the four endangered Colorado River fish species (humpback chub, bonytail, Colorado pikeminnow, and razorback sucker) while the states continue to develop their Colorado River Compact entitlements. With its demonstrated successes, the

Upper Colorado Recovery Program has become a national model for its collaborative conservation efforts to protect endangered species.

The San Juan Recovery Program, established in 1992, is ongoing in the San Juan River Basin with participation from the states of Colorado and New Mexico; four Native American tribes and nations including the Jicarilla Apache, Navajo, Southern Ute Indian, and Ute Mountain Ute Indian; and affected federal agencies including Reclamation, the Bureau of Indian Affairs, BLM, and U.S. Fish and Wildlife Service. The goal of the San Juan Recovery Program is to protect and recover the native fish communities in the San Juan River while providing for continued water development consistent with state and federal laws.

As a result of activities being conducted by both the Upper Colorado and San Juan Recovery Programs, aggressive efforts are being made to stock sufficient numbers of Colorado pikeminnow, razorback sucker, and bonytail to provide the basis for self-sustaining populations that lead to down-listing and de-listing of the species. Capital projects constructed include fish passages, fish screens, habitat improvement projects, hatcheries, levee breeches, storage reservoirs, and irrigation system upgrades. In addition, existing CRSP storage facilities are now being operated to enhance natural resources. To date, the two Recovery Programs have served as the prudent alternative for water projects depleting more than 3.7 million acre-feet of water annually while avoiding ESA related litigation.

The John D. Dingell, Jr. Conservation, Management, and Recreation Act of 2019 (P.L. 1169) reauthorized federal funding for both Recovery Programs through fiscal year 2023. As required by the amended legislation, the Secretary must submit a Report to Congress no later than September 30, 2021, describing the accomplishments of the Recovery Programs to date, the status of the endangered fish, expenditures of the Recovery Programs, and activities to be carried out under the Recovery Programs after September 30, 2023. Capital construction funding using appropriated funds is authorized through 2023.

APPROPRIATIONS OF FUNDS BY THE UNITED STATES CONGRESS

The funds appropriated[11] for fiscal year 2020 for construction of the CRSP and participating projects, recreational, fish, and wildlife activities were $110,464,000. Recreational, fish and wildlife activities received a total of $3,078,000.

[11] Approved by Congress, minus recissions.

TABLE 12. Colorado River Storage Project Fiscal Year 2020 Program

CRSP Initial Units & Participating Projects		
Initial Units, CRSP	$25,000	$25,000
Participating, CRSP	$22,272,000	$22,089,000
Salinity, CRBSCP	$13,965,000	$16,065,000
CRSP Indian Water Rights Settlement		
Navajo-Gallup Water Supply	$55,250,000	$69,182,000
TOTAL – Upper Colorado River Appropriated Funds	$91,512,000	$107,386,000
Recreation and Fish and Wildlife Facilities		
Recreational Facilities	$410,000	$310,000
Fish and Wildlife Facilities	$3,030,000	$2,768,000
TOTAL – CRSP Section 8	$3,440,000	$3,078,000
TOTAL – Construction & Section 8	**$94,952,000**	**$110,464,000**

TABLE 13. Appropriations Approved by Congress for the Colorado River Project and Participating Storage Projects[12]

Fiscal Year	Amount
1957	13,000,000
1958	35,142,000
1959	68,033,000
1960	74,460,000
1961	58,700,000
1962	52,535,000
1963	108,576,000
1964	94,037,000
1965	55,800,000
1966	45,328,000
1967	46,648,000
1968	39,600,000
1969	27,700,000
1970	25,740,000
1971	24,230,000
1972	27,284,000
1973	45,770,000

[12] This information was prepared in good faith on the basis of information available at the date of publication.

1974	24,426,000
1975	22,967,000
1976	53,722,000
1977	55,200,000
1978	67,051,000
1979	76,799,000
1980	81,502,000
1981	125,686,000
1982	130,063,000
1983	132,942,000
1984	161,104,000
1985	163,503,000
1986	97,412,000
1987	110,929,000
1988	143,143,000
1989	174,005,000
1990	163,653,000
1991	145,063,000
1992	92,093,000
1993	69,333,000
1994	46,507,000
1995	23,272,000
1996	27,049,000
1997	22,410,000
1998	17,565,000
1999	10,560,000
2000	13,908,000
2001	14,403,000
2002	16,000,000
2003	35,000,000
2004	55,640,000
2005	57,512,000
2006	64,320,000
2007	69,815,000
2008	65,175,000
2009	50,653,000
2010	63,144,000
2011	25,658,000
2012	39,376,000
2013	53,905,000
2014	86,047,000
2015	108,390,000
2016	122,080,000
2017	116,364,000
2018	101,470,000
2019	122,227,000
2020	110,464,000
Total	**$4,472,093,000**

Plus: NIIP appropriations (funds transferred to Reclamation only)	$630,010,000
TOTAL APPROPRIATIONS	**$5,102,103,000**
Excluding non-reimbursable funds for fish and wildlife, recreation, etc., under Section 8 of P.L. 485, 84th Congress, and all under financing and recession actions.	

Table 13 shows the total funds (rounded to the nearest $1,000) approved by the United States Congress for the CRSP and participating projects and chargeable against the limitations of various authorizing Acts (P.L. 485, 84th Congress, CRSPA, as amended in 1972 by P.L. 32-370 and in 1988 by P.L. 100-563; P.L. 87-485, San Juan-Chama and Navajo Indian Irrigation Projects Act; P.L. 88-568, Savery-Pot Hook, Bostwick Park, and Fruitland Mesa Projects Act; and P.L. 90-537, CRBPA).

COLORADO RIVER BASIN TITLE II SALINITY CONTROL PROGRAM

Information relative to the Colorado River Basin Title II Salinity Control Program in the Colorado River Basin has been provided by the United States Department of the Interior, Bureaus of Reclamation and Land Management, and the United States Department of Agriculture (USDA), NRCS. Discussion of the Title II, Colorado River Basin Salinity Control Act, P.L. 93-320, (approved June 24, 1974) (Salinity Control Act) and its amendments can be found in earlier versions of this annual report.

Reclamation's salinity control programs in the Colorado River Basin are described below. They include the Colorado River Basinwide and the Basin States Salinity Control Programs. The BLM's salinity control program in the Colorado River Basin and the NRCS's salinity control activities in the Colorado River Basin are also described in this section. Additional information on these programs can be found in earlier annual reports of the Upper Colorado River Commission.

COLORADO RIVER BASINWIDE SALINITY CONTROL PROGRAM

The Colorado River Basinwide Salinity Control Program (Basinwide Program) is being implemented under the authorities provided by the 1995 amendment (P.L. 104-20) to the Salinity Control Act. Through the Basinwide Program, projects are selected through Funding Opportunity Announcements (FOAs).

In 2020, $10.305 million of appropriations and $4.416 million of Basin Funds were devoted to Reclamation's Basinwide Program for a total of $14.721 million. It is estimated that the facilities installed with the $14.721 million will control over 9,500 tons of salt loading each year. As of September 30, 2020, Reclamation calculates the appropriation ceiling to be $654,590,847; total expenditures are $512,772,245; and the remaining ceiling balance is $141,818,602.

Reclamation is implementing salinity control through the Basinwide Program in the project areas shown below:

Colorado

Clipper Center Lateral Pipeline Project

Selected under the 2015 FOA, the Crawford Clipper Ditch Company was awarded a $3.15 million cooperative grant to pipe approximately 4.3 miles of existing, unlined earthen irrigation canals located near Crawford, Colorado, and along Cottonwood Creek, a tributary to the Gunnison River. This will result in an annual salt load reduction of approximately 2,606 tons to the Colorado River, at a cost effectiveness of $50.43 per ton. The piping project will consist of buried HDPE and PVC pipe. The cooperative agreement was executed in March 2016 and construction began the winter of 2019. The pipeline was completed in the spring of 2020, and the habitat mitigation was completed in the summer of 2020. The

Company requested and was granted a modification to use the remaining funds to pipe 2,400 ft of the Clipper West lateral, to be completed by Spring 2021.

Fire Mountain Canal Salinity Reduction Piping Project

Selected under the 2015 FOA, the Fire Mountain Canal and Reservoir Company was awarded a $2.95 million cooperative grant to pipe or abandon approximately 4.24 miles of existing, unlined earthen irrigation canals located near Hotchkiss, Colorado, and along the north side of the North Fork of the Gunnison River. This will result in an annual salt load reduction of approximately 2,365 tons to the Colorado River at a cost effectiveness of $52.07 per ton. A portion of the project is funded by the NRCS through the Regional Conservation Partnership Program for $1.32 million. A cooperative agreement was executed in September 2017 and construction began in December 2018. The project was completed in the spring of 2020.

Gould Canal A in Montrose, Colorado

Selected under the 2017 FOA, the Fruitland Irrigation Company was awarded a $4.294 million cooperative grant for four stages of work. "Section 1" will be piping approximately 1.17 miles of existing open earth irrigation canal with buried HP Storm or similar pipe. "Upper Tunnel" consists of slip liner construction for the upper tunnel. "Section 3" includes lining approximately 1.41 miles of unlined canal with 30 mil PVC membrane with shotcrete cover. "Section 4" consists of lining approximately 0.76 miles of unlined canal downstream of Section 3 using the same method. All four section will be responsible for controlling approximately 3,137 tons of salt annually. Fruitland Irrigation Company requested and received a modification to change a portion of sections 3 and 4 from a lined canal to a pipeline. Construction of the pipeline is scheduled to begin in the fall of 2020. The project is expected to be completed by the spring of 2023.

Gould Canal B in Montrose, Colorado

Selected under the 2017 FOA, the Fruitland Irrigation Company was awarded a $3.545 million cooperative grant for three stages of work. "Lower Tunnel" consists of slip liner construction for the lower tunnel. Section 2 includes lining approximately 2.10 miles of unlined irrigation canal with 30 mil PVC membrane with shotcrete cover. Section 5 consists of lining roughly 2.30 miles of unlined canal using the same methods as Section 2. These improvements will control 2,564 tons of salt annually. Fruitland Irrigation Company requested and received a modification to change a portion of section 2 from a lined canal to a pipeline. Construction of the pipeline is scheduled to begin in the fall of 2020. The project is expected to be completed by the spring of 2023.

Figure 12. Backfilling Pipeline on Section Two of the Gould Canal Improvement Project B - in Crawford, Colorado

Grand Valley Irrigation Company (GVIC) 550 Salinity Control Program

Selected under the 2019 FOA, the GVIC was awarded a $1.2 million cooperative grant to line approximately 1.0 mile of their main irrigation canal within the Grand Valley. This will result in a salt load reduction of approximately 743 tons annually at a cost effectiveness of $62.70 per ton. The canal lining will consist of a 30-mil PVC membrane with 3-4 inches of shotcrete cover. The cooperative agreement was executed in July 2020. Construction is scheduled to begin on November 2021 and completed in March 2024.

Grand Valley WUA Government Highline Canal – Reach 1A Lower

Selected under the 2019 FOA, the Grand Valley Water Users Association (GVWUA) was awarded a $4.76 million cooperative grant to line approximately 1.2 miles of their main irrigation canal within the Grand Valley. This will result in a salt load reduction of approximately 3,083 tons annually at a cost effectiveness of $57.75 per ton. The canal lining will consist of a 30-mil PVC membrane with 3-4 inches of shotcrete cover. The cooperative agreement was executed in June 2020, construction began in November of 2020, and is scheduled to be completed by March 2024.

Needle Rock Ditch

Selected in the 2019 FOA, the Needle Rock Ditch Piping Project near Crawford, CO, was selected to be awarded a $4,238,228 to replace approximately 6.7 miles of existing earthen irrigation canals and laterals with buried PVC pipe. This project will control 2,952 tons of salt annually. Construction is scheduled to begin in November 2021 and expected to be completed by the end of April 2023.

North Delta Canal – Phase 1

Selected under the 2015 FOA, the North Delta Irrigation Company was awarded a $5.56 million cooperative grant to pipe approximately 5.97 miles of existing, unlined earthen irrigation canals located near Delta, Colorado, and along the north side of the Gunnison River. This will result in an annual salt load reduction of approximately 4,383 tons to the Colorado River at a cost effectiveness of $52.92 per ton. The piping project will consist of 1.41 miles of buried HDPE pipe and 3.02 miles of gravity flow pipe (piping is providing a 1.54-mile shortcut). A cooperative agreement was executed in April 2016 and construction began in 2018. The project was completed in the spring of 2020.

Orchard Ranch Ditch Piping Project

Selected under the 2015 FOA, the Orchard Ranch Ditch Company was awarded a $1.28 million cooperative grant to pipe approximately 2 miles of existing, unlined earthen irrigation canals located near Orchard City, Colorado, and along Surface Creek, a tributary to the Gunnison River. This will result in an annual salt load reduction of approximately 1,004 tons to the Colorado River at a cost effectiveness of $53.16 per ton. The piping project will consist of buried HDPE pipe. A cooperative agreement was executed in April 2016 and construction began in January 2019. The project was completed in 2020.

Paradox Valley Unit

The Paradox Valley Unit, operating since 1996, has intercepted and disposed of approximately 95,000 tons of salt annually by injecting it into a 14,000-foot well. On March 4, 2019, a M4.5 earthquake occurred approximately 1.5 km SW of the injection well and the injection operations were immediately suspended. Since the main shock, over 3,000 aftershocks have been recorded and are still occurring,

although less frequently.

A six-month injection test at a reduced injection rate was started on April 21, 2020, at a rate of 113 gpm. The test was suspended on May 29, 2020 to allow for the injection test plan to be peer reviewed. The plan was found to be acceptable and appropriate.

Reclamation made the decision to turn off the well. Analyses of the earthquake and aftershocks and pore pressure diffusion modeling are being conducted to determine the appropriate decision regarding operation of the well.

A Draft EIS to evaluate the impacts of alternative methods for salinity control at Paradox was prepared with three action alternatives and a "no action" alternative being evaluated. The three action alternatives are a new deep injection well, evaporation ponds, and zero liquid discharge technology. The Draft EIS was released for public review and comment from December 6, 2019 through February 19, 2020. Issuance of a Final EIS is anticipated in December 2020.

Uncompahgre Valley Water Users Association (UVWUA) – Phase 9 East Side Laterals Project

As a result of the 2015 FOA, the UVWUA was selected to be awarded a $5.4 million cooperative agreement for Phase 9 of the East Side Laterals. This phase involves piping or abandoning an additional 21.6 miles of laterals off of the Selig and East Canals, resulting in an expected annual salt reduction of 6,030 tons, at a cost effectiveness of $37.07 per ton. A portion of the project is funded by the NRCS through the Regional Conservation Partnership Program. The cooperative agreement was executed in September 2017. Construction began in 2018 and will be completed in 2021.

Upper Stewart Ditch, Paonia, Colorado

Selected under the 2017 FOA, the Stewart Ditch & Reservoir Company was awarded a $2.507 million cooperative grant. This pipeline project will eliminate and replace 13,142 feet of open earthen canal, 450 feet of existing corrugated metal pipe, and 243 feet of miscellaneous piped sections. The proposed pipeline starts at the west side of Lamborn Mesa Road in Paonia, Colorado, and continues west until it reaches the existing Stewart Ditch pipeline. In this stretch of canal there is a 450-foot section of existing 42-inch CMP pipe that will be removed and replaced with new PVC pipe. This will result in an annual salt load reduction of approximately 1,622 tons to the Colorado River at a cost effectiveness of $58.67 per ton. The cooperative agreement was executed in August 2018 and construction began in the fall of 2020. The project is expected to be completed in the spring of 2023.

Figure 13. Intake structure for Upper Stewart Ditch Project in Paonia, Colorado.

Tuner/Lone Cabin Ditch

Selected in the 2019 FOA, the Turner and Lone Cabin Ditch project near Paonia, CO, was awarded a $6,195,859 cooperative agreement. The project will replace approximately 25 miles of existing earthen irrigation canals and laterals with buried pipe. This project will control 3,398 tons of salt annually. Construction is scheduled to begin in November 2021 and expected to be completed by December 2022.

Webber Ditch Piping Project, Mancos Colorado

Selected under the 2019 FOA, the Webber Ditch Company was awarded a $3.3 million cooperative grant for piping approximately 4.24 miles of existing earthen irrigation canal. The pipeline will consist of buried PVC pipe. This will result in a salt load reduction of approximately 2,066 tons annually at a cost effectiveness of $59.99 per ton. The cooperative agreement was executed in July 2020. Construction is scheduled to begin in 2021 and to be completed in the spring of 2024.

New Mexico

San Juan River Dineh Water Users (SJRDWU) Salinity Control Project

The SJRDWU provides irrigation water to Navajo Nation farmers along the San Juan River from Farmington past Shiprock, New Mexico. This project was selected under the 2015 FOA and Reclamation entered into a cooperative agreement in 2016 with the SJRDWU for financial assistance totaling $4.84M. The project, totaling $6.7M will replace 15 secondary earthen laterals totaling 182,917 feet with underground

pressurized pipelines. The salt load reduction estimate for the project is 4,381 tons per year and the estimated cost effectiveness is $46 per ton per year. Funding in the amount of $1.89 million will be provided by the Navajo Nation Department of Water Resources Water Settlement Funding. The environmental compliance was completed in February 2018 and construction began soon after. The habitat replacement project, which restored flow from the San Juan River to a historic secondary channel is complete. The majority of the laterals have been converted to pipeline and the remaining laterals are scheduled to be completed by the summer of 2021.

San Juan Dineh Water Users (SJRDWU) – Shiprock Lateral Conversion Phase II

Selected in the 2019 FOA, a cooperative agreement was executed with the SJRDWU in 2020 for the amount of $1.2M. The project will control 751 tons of salt annually with a cost effectiveness of $60.64 per ton. The proposed project is to convert 15 laterals from earthen ditches into underground pressurized pipelines and to convert two sections of the Hogback Canal into a pipeline resulting in the elimination of a sluiceway that discharges flow back to the San Juan River via an artificial earthen channel. Overall, the proposed project will convert 6,393 ft of main canal into a pipeline, 47,110 ft of earthen laterals into underground pressurized pipeline, and eliminate a 2,770 ft of earthen sluiceway channel.

Utah

Ashley Upper and Highline Canals Rehabilitation Project

This project was selected under the 2015 FOA. This project is located in Uintah County in the vicinity of Vernal, Utah. The proposed project will eliminate the open and unlined Ashley Upper Canal and Highline Canal of a combined length of about 29.3 miles (Ashley Upper Canal 13.1 miles and Highline Canal 16.2 miles). They will be replaced with about 21.9 miles (115,500 feet) of HDPE and PVC pipeline ranging in diameter from 63 inches to 10 inches. The salt load reduction estimate for the project is 2,713 tons per year and the estimated cost effectiveness is $54 per ton per year. A cooperative agreement was executed in September 2016 with the Ashley Upper Irrigation Company in the amount of $3.51 million from the Basinwide Program. Funding in the amount of $10.4 million is being provided by a loan from the Utah Board of Water Resources. Construction began in the fall of 2020 and is expected to be completed in the spring of 2023.

BASIN STATES SALINITY CONTROL PROGRAM

P.L. 110-246, signed into law on June 18, 2008, amended the Salinity Control Act creating the Basin States Salinity Control Program (BSP) to be implemented by the Secretary through Reclamation. Funds expended through the BSP come from Basin Funds.

In 2020, Reclamation expended $4.2 million through the BSP. While some of the funds were provided to state agencies and NRCS offices in the states of Colorado,

Utah, and Wyoming to assist in implementing the BSP, most of the funds were utilized for the salinity control projects described below. Funds were also expended to conduct research, studies, and investigations for further implementation of the program.

Reclamation solicits projects through a FOA for both the Basinwide Program and the BSP. Through the FOA process, projects are ranked into a competitive range, but due to lack of funding not all projects in the competitive range are able to be funded through the Basinwide Program. Reclamation approves some of these projects to be funded through the BSP.

Bureau of Reclamation

Reclamation is implementing salinity control through the BSP in the projects shown below:

Muddy Creek Irrigation Company Piping Project Phase III

Reclamation executed a cooperative agreement with Muddy Creek Irrigation Company in September of 2018 and construction is scheduled to begin in October 2019. The project budget is $4,583,000 to pipe approximately 7.3 miles of existing, unlined earthen irrigation ditch located near Emery, Utah. This will result in an annual salt load reduction of approximately 3,010 tons to the Colorado River at a cost effectiveness of $57.78 per ton. The piping project will consist of buried HDPE pipe and is expected to be completed in 2022.

Root & Ratliff Pipeline Project

Selected in the 2017 FOA, Root & Ratliff Ditch Company, located in Mancos, Colorado, will replace 29,000 feet of earthen canals with just over 27,248 feet of PVC pipe. This project will result in an annual salt load reduction of approximately 2,347 tons to the Colorado River at a cost effectiveness of $58.21 per ton. The cooperative agreement was executed in September 2018 with construction planned to begin in the fall of 2020 and be completed in 2022.

Shinn Park/Waterdog Laterals Salinity Reduction Project

Located near Montrose, Colorado, the Shinn Park/Waterdog Laterals Salinity Reduction Project will include piping two Bostwick Park Water Conservancy District laterals. The Shinn Park lateral of approximately 17,370 feet of open, earthen ditch will be replaced with HDPE pipe. The Waterdog lateral will pipe approximately 23,540 feet of open, earthen ditch with HDPE pipe. The two laterals will result in an annual salt load reduction of approximately 3,304 tons to the Colorado River at a cost effectiveness of $47.51 per ton. The cooperative agreement was executed in September 2018, construction began in the fall of 2019, and is expected be completed in 2021.

Jerdan, West, Hamilton Laterals Pipeline Project

Selected in the 2017 FOA, the Crawford Clipper Ditch Company near Crawford, Colorado, was selected to be awarded a $4 million cooperative agreement for piping approximately 6.7 miles of existing earthen irrigation canal. The pipe will consist of buried PVC pipe. This project will control 2,584 tons of salt annually with 20 acres of potential on farm improvements. Construction is scheduled to begin in November 2021 and expected to be completed by the spring of 2022.

Interstate Canal Salinity Reduction project

This project was selected from the 2019 FOA. A cooperative agreement was executed in September 2020 for the amount of $5,284,119. This project, located in Southwestern WY, adjacent to the WY-UT border near McKinnon, WY, will replace approximately 13.1 miles of an unlined earthen canal with a pressurized HDPE pipeline system resulting in the annual reduction of 2,295 reportable tons of salt in the Colorado River. This project is in the pre-construction phase with construction expected to begin in the Spring/Summer of 2021.

Pilot Rock Ditch Piping Project

This project was selected from the 2019 FOA. A cooperative agreement was executed with the Pilot Rock Ditch company in June 2020 for $940,401. This project, located near Crawford CO, will replace approximately 1.5 miles of an unlined earthen canal with a pressurized pipeline system. This will result in the annual reduction of 665 reportable tons of salt in the Colorado River. This project is in the pre-construction phase with construction expected to begin in the Spring/Summer of 2021.

Short Ditch Extension Piping

This project was selected from the 2019 FOA. A cooperative agreement was executed with the Short Ditch Extension Company in July 2020 for $548,687. This project, located near Hotchkiss CO, will replace approximately 1.1 miles of an unlined earthen canal with a pressurized pipeline system. This project will result in the annual reduction of 419 reportable tons of salt in the Colorado River. This project is in the pre-construction phase with construction expected to begin in the Fall of 2021.

Colorado Water Conservation Board

Lower Gunnison Basin Salinity Program Coordinator

The Colorado Department of Agriculture continues to employ a full-time salinity program field coordinator. His position is funded by the Basin States Program. This makes it possible for the State of Colorado to give input on salinity projects and work that is going on in the state. The coordinator has now begun working with potential applicants for the next FOA.

Utah Department of Agriculture and Food

The Utah Department of Agriculture and Food (UDAF) received two projects from Reclamation's 2015 FOA to be funded under the BSP. Those two projects are the

Antelope and North Laterals Salinity Project and the Rock Point Canal Project.

Antelope and North Laterals Salinity Project

The Antelope and North Laterals Salinity Project was completed during the 2019-2020 winter construction period. Completion of the diversion structure allows the efficient measurement and delivery of irrigation water to the Antelope and North lateral water users. The system is now complete and functioning. All funds were expended.

Rock Point Canal Project

Rock Point Irrigation Company started construction on their system the fall of 2018 and continued construction through the fall of 2019. The construction was slowed because of weather and substantial completion was delayed until the summer of 2019. There has also been issues with pipe and joint failures which have been repaired. Currently there is an issue with the canal company and contractor to complete project cleanup. Completion of this project is anticipated the fall or early winter of 2020.

Uintah Basin Salinity Coordinator

UDAF, through its agreement with Reclamation, continues to employ the Uintah Basin Salinity Coordinator using BSP funds. With concurrence from the Salinity Forum, Reclamation, in 2017, approved the coordinator to work with entities in other areas of the Colorado River Basin in Utah.

Wyoming Water Development Commission

A new agreement between Reclamation and the Wyoming Water Development Commission (WWDC) was put in place in 2016 to use BSP funds that will end in 2020. The new agreement is similar to agreements with the UDAF and Colorado State Conservation Board. The agreement has a value of $2,800,000 for the construction of projects and salinity studies in Wyoming.

Eden Valley, Farson/Eden Pipeline Project

This project came through Reclamation's 2015 FOA. The project is for a canal-to-pipeline conversion project with the Eden Valley Irrigation and Drainage District (EVIDD). The project will convert approximately 6 miles of irrigation canal to pipeline. The project includes piping the Farson F-2, F-3, F-4, and F-5 laterals. The project budget is $4.39 million with $2.366 million in funding provided by the WWDC and $2 million provided by the Wyoming BSP. The project will result in salt control of 1,619 tons and a cost effectiveness of $52.11 per ton. Currently, the project has secured the services of an engineer and has entered the design phase of the project. The project secured the necessary permits, bid and awarded the project. The project needed additional funding of $910,000. WWDC has provided EVIDD an additional grant of $700,000 and a loan of $210,000. Construction of the project began in the fall of 2019 and was completed by the 2020 irrigation season.

BUREAU OF LAND MANAGEMENT SALINITY CONTROL PROGRAM

From fiscal year 2017 to 2019, Congress directed the Bureau of Land Management (BLM) to spend $1,500,000 of their funds on salinity projects through their Soil, Water, and Air Program via the Salinity sub-activity. These salinity projects are required under the direction of P.L. 106-459 that "a comprehensive program for minimizing salt contributions to the Colorado River from lands [be] administered by the BLM..." From 2014-2019, state leads, commonly the hydrologists, assist the BLM field-office-salinity-funded-project-manager. The salinity coordinator provides ongoing project and report assistance. From fiscal year 2014 to 2019, the salinity program increased salt retention on land and from entering the Colorado River from 1,248 salt tons to more than 9,269,556 true salt tons retained on BLM land as verified through several BLM programmatic data. In 2019, several wildfire occurrences within the BLM Colorado River Basin boundaries were measured for their following 5-year impact on sediment and salinity transport to the Colorado River and its tributaries.

The salinity sub-activity funded projects ($1.5 M), including de-amortized carryover since 2014 account for 198,782 salt tons retained on BLM lands in fiscal year 2019. This improvement reflects the ability of the projects to implement more erosion control practices on saline lands that decrease topsoil loss, improve soil moisture and nutrient retention, and inevitably maintain the vegetative landscape with increased salinity funding. The 17 funded projects are presented in Table 14. In January 2018, the BLM Salinity sub-program released A Framework for Improving the Effectiveness of the Colorado River Basin Salinity Control Program, 2018-2023. All salinity efforts fit within this framework and continue to meet BLM's mission. Table 15 lists the salt tons retained accomplishments per state, respectively. Recent projects have evolved to incorporate eight BLM watersheds that include upstream impact from point and nonpoint sources, linking and developing groundwater model to a surface water model to assist with salt flow transport pathways, determining a systematic approach for gaps in SSURGO soils databases, inventing a landscape-based wind erosion tool to capture the dominant form of sediment and salt transport, the addition of priority salinity equations from the western states within the Colorado River Basin to the BLM version of the Agricultural Policy/Environmental eXtender model that is being used to overlay many of the BLM's programmatic data to best quantify the BLM landscape and activities in order to minimize salt contributions to the Colorado River.

TABLE 14. Bureau of Land Management Salinity Control Projects
Fiscal Year 2019

#	State	Funding	Description
1.	AZ	70,000	Arizona Strip Field Office Salinity Control Structures
2.	CO	50,000	Salinity Loading post-fire erosion
3.	CO	100,000	Plot to Watershed Scale Data at Prior Runoff Sites

4.	CO	150,000	Geomorphic Salinity Analysis
5.	CO	57,000	Zone L Grand Junction Travel Management Plan
6.	CO	150,000	Salinity/sediment transport to Co River from historic BLM soil-moisture and sediment retention treatment
7.	NOC	150,000	APEX with MODFLOW for Simulating Sediment & Salt Transport in Groundwater/Surface Water
8.	NOC	295,000	APEX with a geochemically reactive transport tool, wind erosion tool and resolve data gaps
9.	NM	80,000	Simon Canyon
10.	NM	70,000	San Juan River Watershed
11.	UT	50,000	Kanab Field Office Salinity Control
12.	UT	55,000	Telegraph Flat Head Cut/Gully Restoration for Salinity Reduction
13.	UT	60,000	GSENM/KFO Sediment, Erosion, Salinity Loading Rates
14.	UT	65,000	GSENM Salinity Control
15.	WY	12,000	Muddy Creek Habitat Improvement
16.	WY	15,000	Savery Creek Stabilization
17.	WY	71,000	Big Piney/La Barge Erosion Project
TOTAL: $1,500,000			

TABLE 15. Salinity States and their Contributions to Retaining Sediment/Salts on BLM lands

State	Cumulative Total Salt Tons Retained from Salinity Funded Projects	Final Salt Tons Retained on BLM Lands from Salinity Funded Projects
AZ	11,537	
CO	6,000	
NM	84,734	**198,782**
UT	38,630	
WY	57,881	

* Numbers reported are subject to the updating of BLM data.
§ Deamortization has been applied to carryover salt tons.

Arizona

Arizona Strip Field Office Salinity Control Structures

Across the Arizona Strip, there are hundreds of erosion control structures that have been built and continue to be repaired to slow storm water runoff, reduce salinity, and prevent valuable soil loss that end in the Colorado River system. This project

helped to address maintenance on numerous structures. Tamarisk removal also occurred.

Colorado

Geomorphic Salinity Analysis

This BLM funded project focuses on characterizing the dominant processes controlling sediment and salinity mobilization in ephemeral streams on BLM land. The majority of the landscapes are within the Mancos Shale layers of the Grand Valley to determine geomorphic response thresholds including channel geometry, stream classification, and quantification of additional channel characteristics to develop a conceptual model of channel change processes and cycles. The USGS is a collaborator on this project.

Salinity Loading Post-Fire Erosion

Installation of sediment gauges in Grand Junction.

Long-term Impacts on Salinity and Sediment Transport

The BLM Salinity Coordinator and the U.S. Geological Survey are documenting if water throughout the soil profile depth and below storage water ponds are saline and whether they could contaminate groundwater. A concern is the proximity of these impoundments to other uses of BLM lands.

Pilot to Watershed Scale Data at Prior Runoff Sites

Soil sampling the watersheds of the areas where the rainfall simulations occurred. The USGS is a collaborator on this project.

Paired Basin Study with Energy Development (Stinking Water Gulch)

This is the second to last data collection year for the Paired Basin Study that aims to provide insight into how different land uses affect the distribution, storage, and release of sediment, salinity, and selenium in surface-water systems. This study is a collaboration of the USGS and BLM Uncompahgre Field Office.

New Mexico

San Juan River Watershed (SJRW) Integrated Salinity Reduction and Vegetation Management

The BLM's Farmington Field Office manages the entire SJRW. Many approaches to salinity reductions are necessary to minimize transport to the Colorado River including the removal of Pinyon-Juniper trees, reseeding projects, thinning trees, establishment of understory growth with native riparian habitat, sediment fences, sediment retention structures cleaned and dams built, roads improved, and silt traps built to help curtail sediment and salt loading into the Colorado River. The

SJRW projects have resulted in 24,252 salt tons retained on the land in 2018.

San Juan River Watershed Maintenance

This project has been successful in the reduction of salinity transport and remains for the maintenance of La Manga Canyon and one major structure.

Simon Canyon

Approximately 35 acres of Pinyon-Juniper encroachment have been thinned and seeded; approximately 500 acres of Pinyon-Juniper encroachment in the Simon Canyon Watershed and Middle Mesa have been treated using heavy equipment; and the areas have been reseeded yielding an approximate 3,100 salt tons retained.

National Operation Center, Colorado

APEX with MODFLOW for Simulating Sediment & Salt Transport in Groundwater/Surface Water & APEX with a geochemically reactive transport tool, wind erosion tool and resolve data gaps

The BLM Salinity Coordinator initiated projects to determine salinity data and knowledge gaps. Used the next five years for data collection with the salinity projects of which the data are used for watershed computer modeling for several areas within the Colorado River Basin. This work builds on five years of data collection from saline rainfall-runoff sites, soils, climate, slope, elevation, wildfire, fuels reduction, hydrology, and vegetation to simulate several site conditions.

The BLM NOC Salinity Coordinator continues to co-develop and collaborate with Texas A&M University-Blackland Research Station modelers on a BLM version of the Agricultural Policy/ Environmental eXtender landscape transport model. Building on the previous three years of preparation and coding, recent work includes the linking and programming of groundwater to surface water equations that can transport salt. The calibration testing is on eight priority sites in four salinity states (UT, CO, NM, and WY) based on where the rainfall simulation field trials occurred.

The most representative hydrologic simulation of each site must be used to obtain the true salt sources and sinks from the databases. Site specific information is input, and APEX is run on a daily time-step with parameter input for several biophysical components. Several BLM management program's salt reduction savings are being added in addition to the salinity funded projects including grazing, oil and gas, fuels treatment effectiveness monitoring to reflect BLM actions toward reducing salt transport across BLM lands entering the Colorado River.

Utah

Assessment of Erosion, Sediment Yield, and Salinity Loading on BLM Lands

The Grand Staircase-Escalante National Monument (GSENM) and the Kanab Field Office are focusing on large canyons with multiple areas needing sediment and salinity control, tamarisk removal, seeding completion to minimize erosion, and maintenance for at least five years. The teams are also removing sediment in detention reservoirs, structures, and other impoundments. As of 2019, 80% of the watershed structures had been cleaned and new structures built as needed; however, maintenance will continue to be needed for the entire canyon.

Wyoming

Muddy Creek Watershed Stabilization

There are two stream restoration projects underway to restore degraded stream channels and improve riparian and aquatic habitat across the watershed.

Savery Creek Stabilization

The Savery Creek project is a multi-year project. The mass wasting and channel breaks are being addressed through implementing natural channel design techniques on the target reaches that would reduce in-channel erosion, sedimentation, and salinity loadings. Restoration efforts are restoring stability to the system and improved aquatic habitat and riparian health. With the changes in WY BLM leadership and the WY landscape changing, priority projects are shifting as funding shifts too.

NATURAL RESOURCES CONSERVATION SERVICE SALINITY CONTROL PROGRAM

The United States Department of Agriculture's (USDA) Environmental Quality Incentives Program (EQIP), which currently provides the vehicle for USDA salinity control activities in the Colorado River Basin, is administered by the Natural Resources Conservation Service (NRCS). In fiscal year 2019, $13.2 million in appropriations was obligated for new EQIP contracts with individual entities to install salinity control measures. An additional $3 million in appropriations was used to provide technical assistance (planning, engineering design, construction inspections, etc.) to these entities.

Salinity control is currently being implemented by the NRCS in 13 authorized project areas: five in Colorado, one in New Mexico and Arizona, five in Utah, and two in Wyoming.

Colorado

Grand Valley Unit

The NRCS considers its Grand Valley Project to be completed. The salt control goal has been exceeded and habitat replacement is complete. The NRCS continues to accept applications to improve irrigation systems that result in additional salt control. In 2020, two new contracts were developed in this unit to treat 124 acres at a cost of $424,538.

Lower Gunnison Basin Unit

The Lower Gunnison Basin Unit, initiated in 1988, is the largest of the USDA salinity control units and is located in Delta, Montrose, and Ouray counties. Over 17,000 acres are planned for treatment. Currently, about 76,000 acres have been treated. The application of salinity reduction and wildlife habitat replacement practices continues to be an integral part of implementation of the Lower Gunnison Basin Unit. In 2020, 47 new contracts were developed on 1,780 acres for planned salt control of about 2,244 tons for $4.0 million. The project is about 70% complete.

Mancos Valley Unit

The Mancos Valley Unit, initiated in 2004, is bounded by the San Juan National Forest to the north, Mesa Verde National Park to the east, and the Southern Ute Indian Reservation to the south. In 2020 NRCS developed one new salinity control contract to control one ton of salt on one acre for $6,519. The project has achieved about 37% of its salt control goal of 11,940 tons.

McElmo Creek Unit

Implementation of the McElmo Creek Unit was initiated in 1990. Currently, about 66% of the salt control goal of 46,000 tons has been implemented. Seventeen new contracts were developed in 2020 to treat 489 acres and control 603 tons of salt annually for $1.2 million.

Silt Area Project

The Silt Project, authorized in 2006, is Colorado's newest project. Through 2020, 2,568 tons of annual salt control have been implemented, or about 63% of the project goal. Two new contracts were developed in 2020 on 15 acres to control 10 tons annually for $50,674.

New Mexico and Arizona

San Juan River Unit

For 30 miles downstream from Farmington, New Mexico, and on both sides of the San Juan River, lies 8,400 acres of irrigated cropland that is part of the Navajo Nation. This area is served by the San Juan River Dineh Water Users, Inc., irrigation company. These lands contribute significant salt load to the San Juan River, and

later to the Colorado River. The NRCS provides technical and financial assistance to Native American farmers who plan to improve irrigation delivery and application.

Utah

Green River Project

The Green River Project is Utah's newest project and was adopted in 2010 with a goal of controlling 6,540 tons of salt annually. Through 2020, about 50% of the salt control goal has been realized. No new contracts were developed in 2020.

Manila-Washam Area

In 2006, a salinity control plan and an environmental assessment were completed by the NRCS on irrigated lands near the community of Manila, Utah, along the border with Wyoming. The project would ultimately treat about 11,000 acres with a goal of reducing salt loading by about 17,000 tons annually. Reclamation has assisted in the improvement of most of the off-farm delivery systems to the project area so that water deliveries are now better managed with seepage, spillage, and wastage eliminated. Through 2019, 58% of the salt control goal has been reached. In 2020, no new contracts were developed. The wildlife habitat replacement requirements are currently deficient and NRCS continues to promote additional habitat contracts.

Muddy Creek Unit

In 2003-2004, the NRCS conducted planning activities for salt control in cropland areas irrigated from Muddy Creek near the town of Emery, Utah. The Muddy Creek Unit was officially approved in 2005. Ultimately, the opportunity exists to convert about 6,000 acres of flood-irrigated cropland to sprinkled cropland. Through 2020 about 650 acres have been converted. The Emery Canal is being piped and will facilitate future treatment of most of the target acres for this project. In 2020, NRCS developed 10 new contracts on 620 acres for $1 million that will control 855 tons of salt annually.

Price-San Rafael Rivers Salinity Control Unit

Reclamation and the NRCS issued a joint EIS for the Price-San Rafael Rivers Salinity Control Unit in December 1993. The ROD indicated that more than 36,000 acres of irrigated lands would receive salt control measures and that several hundred miles of earthen canals and laterals would be replaced with buried pipelines. Each agency has proceeded to implement control measures as its funding and authority allows. The larger units (Ferron, Wellington, Moore Group, Carbon Canal, and Huntington-Cleveland) have been substantially implemented; both on farm and off farm. In 2020, 27 new contracts were developed on 727 acres and will control about 2,081 tons of salt annually for $1.27 million.

Uintah Basin Unit

Implementation of the USDA on-farm portion of the Uintah Basin Unit started in 1980. Side-roll and center pivot sprinkler systems predominate in the project area. In 2020, 40 new contracts were developed on 579 acres and will control 720 tons of salt annually for $2.2 million. Landowner participation has exceeded expectations to such an extent that the original salt control goal has been exceeded. Currently, more than 151,000 tons of annual salt control occurs on the irrigated agricultural lands.

Wyoming

Big Sandy River Unit

On-farm salinity control implementation has been underway on the Big Sandy River Unit since 1988. The original goal for salinity reduction is 70% complete and wildlife habitat replacement is complete, though there may have been some loss of habitat in recent years. More than 58,000 tons of annual salt control has been achieved on the project. Where practical, farmers have converted nearly all surface flood irrigation to low-pressure sprinkler irrigation systems for salinity control. Remaining untreated acres are largely controlled by producers who are uninterested in implementing salinity controls, so salinity funds were not allocated to the Big Sandy Unit in 2020.

Henrys Fork River Unit

The Henrys Fork River Unit is the NRCS's newest salinity control project area; authorized in 2013. In 2020, one new contract was obligated to control 22 tons annually on 25 acres.

Additional Projects

In 2010, the NRCS began to quantify the salt control being provided by EQIP irrigation improvement contracts in areas outside of the approved project areas, but within the Upper Colorado River Basin. These have been named "Tier II" areas. In 2020, Colorado NRCS developed six new EQIP contracts on 338 acres in Tier II areas to control about 700 tons of salt annually.

Upper Colorado River Commission

APPENDIX A
Annual Financial Report

For the Year Ended
June 30, 2020

Upper Colorado River Commission

Annual Financial Report

With Auditors' Report Thereon

Year Ended June 30, 2020

Upper Colorado River Commission

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INDEPENDENT AUDITORS' REPORT

The Commissioners of the
Upper Colorado River Commission
Salt Lake City, Utah

Report on the Financial Statements

We have audited the accompanying financial statements of the governmental activities and each major fund information of the Upper Colorado River Commission as of and for the year ended June 30, 2020, and the related notes to the financial statements, which collectively comprise the Commission's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities and each major fund information of the Upper Colorado River Commission as of June 30, 2020, and the respective changes in financial position thereof and the budgetary comparison for the general fund for the year then ended in conformity with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, and budgetary comparison information be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the Upper Colorado River Commission's financial statements as a whole. The supplemental schedule of cash receipts and disbursements, and the supplemental schedule of expenses – budget to actual, are presented for purposes of additional analysis and are not a required part of the financial statements.

The supplemental schedule of cash receipts and disbursements, the supplemental schedule of expenses - budget to actual, and the schedule of expenditures of federal awards are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the schedule of cash receipts and disbursements, the supplemental schedule of expenses - budget to actual, and the schedule of expenditures of federal awards are fairly stated in all material respects in relation to the financial statements taken as a whole.

In accordance with *Government Auditing Standards*, we have also issued our report dated September 3, 2020, on our consideration of the Upper Colorado River Commission's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of Upper Colorado River Commission's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering Upper Colorado River Commission's internal control over financial reporting and compliance.

Ulrich & Associates, P.C.

September 3, 2020
Ogden, Utah

This discussion and analysis is intended to be an easily readable analysis of the Upper Colorado River Commission (the Commission) financial activities based on currently known facts, decisions, or conditions. This analysis focuses on current year activities and should be read in conjunction with the financial statements that follow.

Financial Highlights

The overall assets of the Commission exceed its liabilities by $938,054, an increase of $9,413 over the prior year. This increase is due to the discontinuation of the System Conservation Pilot Project in FY2019 and the expenditures being less than budgeted amounts.

Report Layout

Besides this Management's Discussion and Analysis (MD&A), the report consists of government-wide statements, fund financial statements, and the notes to the financial statements. The first two statements are condensed and present a government-wide view of the Commission's finances. Within this view, all Commission operations are categorized and reported as governmental activities. Governmental activities include basic services and administration. The Commission does not have any business-type activities. These government-wide statements are designed to be more corporate-like in that all activities are consolidated into a total for the Commission.

The Statement of Net Position focuses on resources available for future operations. In simple terms, this statement presents a snap-shot view of the assets the Commission, the liabilities it owes and the net difference. The net difference is further separated into amounts restricted for specific purposes and unrestricted amounts.

The Statement of Activities focuses gross and net costs of the Commission's programs and the extent to which such programs rely upon general revenues. This statement summarizes and simplifies the user's analysis to determine the extent to which programs are self-supporting and/or subsidized by general revenues.

The notes to the financial statements provide additional disclosures required by governmental accounting standards and provide information to assist the reader in understanding the Commission's financial condition.

The MD&A is intended to explain the significant changes in financial position and differences in operation between the current and prior years. Significant changes from the prior year are explained in the following paragraphs.

Commission as a Whole

Government-wide Financial Statements

A condensed version of the Statement of Net Position follows:

Net Position at Year-end
June 30

	2020	2019
Cash & investments	$ 1,018,515	$ 929,193
Capital assets (net)	30,490	31,813
Total assets	1,049,005	961,006
Current liabilities	83,848	16,391
Non-current liabilities	27,203	15,974
Total liabilities	110,951	32,365
Net position:		
Invested in capital assets	30,490	31,813
Restricted -SCPP	-	69,650
Unrestricted	907,564	827,178
Total net position	$ 938,054	$ 928,641

During the year ended June 30, 2020, the change in net position was due to the completion of the System Conservation Pilot Program project in FY2019, and expenditures being less than expected. Current liabilities are higher due to the prepayment of the state assessment from Wyoming.

A condensed version of the Statement of Activities follows:

Governmental Activities
For the year ended June 30

	2020	2019
Revenues		
Program Revenues	$ -	$ 625
State Assessments	527,683	535,748
Grants and Contributions	18,147	1,878,166
General Revenues		
Interest	19,561	21,164
Total Revenues	565,391	2,435,703
Expenses		
Administration	486,328	328,787
SCPP	69,650	3,804,440
Total Expenses	555,978	4,133,227
Change in net position	9,413	(1,697,524)
Beginning net position	928,641	2,626,165
Ending net position	$ 938,054	$ 928,641

The completion of the System Conservation Pilot Program and expenditures being less than anticipated created the increase in net position.

Capital Assets

At June 30, 2020 the Commission had $30,490 invested in capital assets, consisting primarily of a building and furniture & equipment. The change in capital assets during the year consisted of purchases of computer equipment and continued depreciation expense.

Capital Assets at Year-end

	2020	2019
Land	$ 24,159	24,159
Building	85,055	85,055
Improvements	2,207	2,207
Furniture & equipment	84,470	82,084
Subtotal	195,891	193,505
Less: Accumulated Depreciation	(165,401)	(161,692)
Capital assets, net	$ 30,490	$ 31,813

Financial Contact

The Commission's financial statements are designed to present users (citizens, taxpayers, state governments) with a general overview of the Commission's finances and to demonstrate the Commission's accountability. If you have questions about the report or need additional financial information, please contact the Commission's secretary at 355 South 400 East, Salt Lake City, UT 84111.

Basic Financial Statements

Upper Colorado River Commission
Statement of Net Position
June 30, 2020

Assets	Governmental Activities
Cash & cash equivalents	
Operations	$ 953,079
Unpaid leave	65,436
Capital assets	
Land	24,159
Building	85,055
Improvements other than building	2,207
Furniture & equipment	84,470
Less: accumulated depreciation	(165,401)
Total Assets	1,049,005
Liabilities	
Accounts payable	4,846
Retirement payable	2,505
Compensated absences	1,492
Prepaid Assessments	75,005
Total current liabilities	83,848
Noncurrent liabilities:	
Accrued compensated absences	27,103
Total noncurrent liabilities	27,103
Total Liabilities	110,951
Net Position	
Net investment in capital assets	30,940
Restricted – SCPP	-
Unrestricted	907,564
Total Net Position	$ 938,054

See accompanying notes to the basic financial statements.

Governmental Activities:	Expenses	Program Revenues: Charges for Services	Program Revenues: Operating grants and contributions	Net Revenue and Changes in Net Position: Total
General administration	$ 486,328	-	545,830	59,502
SCPP	69,650	-	-	(69,650)
Total governmental activities	$ 555,978	-	545,830	(10,148)

General revenues:	
Interest	19,561
Total general revenues	19,561
Change in Net Position	9,413
Net Position - Beginning of Year	928,641
Net Position - End of Year	$ 938,054

See accompanying notes to the basic financial statements.

Upper Colorado River Commission
Balance Sheet
Governmental Funds
June 30, 2020

	General Fund	SCPP Fund	Total
Assets			
Petty cash	$ 25	-	25
Cash in Bank	105,138	-	105,138
Utah public treasurers' investment pool			
Operations	847,916	-	847,916
Unpaid Leave	65,436	-	65,436
	1,018,515	-	1,018,515
Total Assets	1,018,515	-	1,018,515
Liabilities			
Accounts payable	4,846	-	4,846
Retirement payable	2,505	-	2,505
Accrued benefits	1,492	-	1,492
Prepaid assessments	75,005	-	75,005
Total Liabilities	83,848	-	83,848
Fund Balance			
Assigned to:			
Unpaid leave	65,436	-	65,436
Unassigned	869,231	-	869,231
Total Fund Balance	934,667	-	934,667
Total Liabilities and Fund Balance	1,018,516	-	1,018,516

Reconciliation of the Statement of Net Position to the Balance Sheet

Amounts reported for governmental activities in the statement of net position are different because:

Total fund balance report above	$934,667
Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds	30,490
Compensated absences are not due and payable in the current period and, therefore, are not reported in the funds	(27,103)
Net position of governmental activities	$ 938,054

See accompanying notes to the basic financial statements.

Upper Colorado River Commission
Statement of Revenues, Expenditures, and Changes in Fund Balance
Governmental Funds
For the Year Ended June 30, 2020

	General Fund	SCPP Fund	Total
Revenues			
Assessments	$ 527,683	-	527,683
Grants – federal	3,146	-	3,147
Grants - NM	15,000	-	15,000
Interest	19,561	-	19,561
Total Revenues	565,391	-	565,391
Expenditures			
Personal Services	393,947	-	393,947
Travel	20,844	-	20,844
Current operating	36,781	5,322	36,781
Capital Outlay	9,718	-	9,718
Contingencies	3,650	-	3,650
Grants – federal/demand mgmt. expense	3,201	-	3,201
Grants – NM expense	5,735	-	5,735
SCPP return of federal funds	-	64,328	64,328
Total Expenditures	473,876	69,650	543,526
Excess of revenues over expenditures	91,515	(69,650)	21,865
Fund Balance – beginning of year	843,152	69,650	912,802
Fund Balance – end of year	$ 934,667	-	934,667

Reconciliation of the Statement of Revenues, Expenditures and Changes in Fund Balances of Governmental Funds to the Statement of Activities

Net change in fund balance (as reported above)	$ 21,865
Governmental funds report capital outlays as expenditures. However, in the statement of activities, the cost of those assets is allocated over their estimated useful lives as depreciation expense. This is the amount by which depreciation exceeded capital outlays in the current period.	(1,323)
The expense for accrued compensated absences reported in the statement of activities does not require the use of current financial resources and, therefore, are not reported as expenditures in governmental funds.	(11,129)
Change in net position of governmental activities (page 9)	$ 9,413

See accompanying notes to the basic financial statements

Upper Colorado River Commission
Statement of Revenues, Expenditures, and Changes in Fund Balance
Budget and Actual – General Fund
For the Year Ended June 30, 2020

	Original & Final Budget	Actual	Variance w/Final Budget
Revenues			
Assessments	$ 535,748	535,748	-
Grants – NM		15,000	15,000
Grants – federal/demand mgmt. expense		3,147	3,147
Interest	-	19,561	19,561
Total Revenues	527,683	565,391	37,708
Expenditures			
Personal services	426,383	393,947	32,436
Travel	40,000	20,844	19,156
Current operating	48,800	36,781	12,019
Capital outlay	5,500	9,718	(4,218)
Contingencies	7,000	3,650	3,350
Grants – federal/demand mgmt. expense	3,700	3,201	499
Grants – NM expense	15,000	5,735	9,265
Total Expenditures	546,383	473,876	72,507
Excess of revenues over expenditures	(18,700)	91,515	110,215
Fund Balance – beginning of year	843,152	843,152	-
Fund Balance – end of year	$ 824,452	934,667	110,215

See accompanying notes to the basic financial statements.

Upper Colorado River Commission
Statement of Revenues, Expenditures, and Changes in Fund Balance
Budget and Actual – System Conservation Pilot Program
For the Year Ended June 30, 2019

	Original & Final Budget	Actual	Variance w/Final Budget
Revenues			
Grants – federal	$ -	-	-
Non-federal funders	-	-	-
Interest	-	-	-
Total Revenues	-	-	-
Expenditures			
Operations	-	5,322	(5,322)
Return of federal funds	-	64,328	(64,328)
Total Expenditures	-	69,650	(69,650)
Excess of revenues over expenditures	-	(69,650)	(69,650)
Fund Balance – beginning of year	69,650	69,650	-
Fund Balance – end of year	$ 69,650	-	(69,650)

See accompanying notes to the basic financial statements.

Note 1 - Summary of Significant Accounting Policies

A. Reporting entity

The Commission was formed pursuant to the terms of the Upper Colorado River Basin Compact on October 11, 1948, and consented to by the Congress of the United States of America by Act on April 6, 1949, as an administrative agency representing the Upper Division States of the Colorado Basin, namely Colorado, New Mexico, Utah, and Wyoming. The Commission consists of one commissioner representing each of the four states and one representing the United States of America. The activities of the commission are conducted for the purpose of promoting and securing agricultural and industrial development of the Upper Basin's water resources.

The Commission has no component units that are included with this report.

B. Basis of Presentation - Government-wide financial statements

While separate government-wide and fund financial statements are presented, they are interrelated. The governmental activities column incorporates data from the governmental fund. The Commission does not currently have any business-type activities.

C. Basis of Presentation - Fund financial statements

The fund financial statements provide information about the Commission's funds. Statements for the governmental fund category is presented. The emphasis of fund financial statements is on major governmental funds, each displayed in a separate column. The Commission has two governmental funds, General and System Conservation Pilot Program, and both are reported as major funds in the fund financial statements.

D. Measurement focus and basis of accounting

Government wide financial statements

The accounting and financial reporting treatment is determined by the applicable measurement focus and basis of accounting. Measurement focus indicates the type of resources being measured such as current financial resources or economic resources. The basis of accounting indicates the timing of transactions or events for recognition in the financial statements.

The government-wide statements are prepared using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

The governmental fund financial statements are reported using the current financial resources measurement focus and the modified accrual basis of accounting. Revenues are recognized as soon as they are both measurable and available. Revenues are considered to be available when they are collectible within the current period or soon enough thereafter to pay liabilities of the current period. For this purpose, the government considers revenues to be available if they are collected within 60 days of the end of the current fiscal period. Expenditures generally are recorded when a liability is incurred, as under accrual accounting. However, debt service expenditures, as well as expenditures related to compensated absences, and claims and judgments, are recorded only when payment is due. General capital asset acquisitions are reported as expenditures in governmental funds. Issuance of long-term debt and acquisitions under capital leases are reported as other financing sources.

E. Budgetary Information

Annual budgets are prepared on the modified accrual basis of accounting and adopted as required by the compact. The Commission approves the annual budget in total and by major sub-items as identified in the statement of revenues, expenditures and changes in fund balance - budget and actual. The Executive Director has authority to transfer budget accounts within the sub-items with Commissioner approval required to transfer monies between expenditure categories. Currently no formal budget is adopted for the SCPP program.

F. Assets, liabilities, deferred outflow/inflows of resources, and net position/fund balance

Cash & cash equivalents

The government's cash and cash equivalents are considered to be cash on hand, demand deposits, and short-term investments with original maturities of three months or less from the date of acquisition.

Capital Assets and Depreciation

Capital assets, which include property and equipment, are reported in the governmental activities column in the government-wide financial statements. Capital assets are defined by the Commission as assets with an initial, individual cost of more than $1,000 and an estimated useful life in excess of one year.

Depreciation of capital assets is computed and recorded by the straight-line method. Estimated useful lives of the various classes of depreciable capital assets are as follows: buildings, 30 years; improvements, 10 to 15 years; furniture and equipment, 3 to 15 years.

Fund balance policies

Fund balance of governmental funds is reported in various categories based on the nature of any limitations requiring the use of resources for specific purposes. The Commission itself can establish limitations on the use of resources through either a commitment (committed fund balance) or an assignment (assigned fund balance).

Net Position / Fund Balance

Government-wide Financial Statements

Equity is classified in the government-wide financial statements as net assets and can be displayed in three components:

Net investment in capital assets, net of related debt - Capital assets including restricted assets, net of accumulated depreciation and reduced by any debt related to the acquisition or improvement of the assets.

Restricted net position - Net position with constraints placed on the use either by (1) external groups or (2) law through constitutional provisions or enabling legislation.

Unrestricted net position - All other net positions that do not meet the definition of "restricted" or "net investment in capital assets, net of related debt."

Fund Financial Statements

In the fund financial statements, governmental fund equity is classified as fund balance. Fund balance is further classified as Nonspendable, Restricted, Committed, Assigned, or Unassigned. Description of each classification is as follows:

Nonspendable fund balance - Amounts that cannot be spent because they are either (a) not in spendable form, or (b) legally or contractually required to be maintained intact.

Restricted fund balance - Amounts restricted by enabling legislation. Also if, (a) externally imposed by creditors, grantors, contributors, or laws and regulations of other governments, or (b) imposed by law through constitutional provisions or enabling legislation.

Committed fund balance - Amounts that can only be used for specific purposes pursuant to constraints imposed by formal action of the Commission's highest level of decision making authority.

Assigned fund balance - Amounts that are constrained by the Commission's intent to be used for specific purposes, but are neither restricted nor committed.

Unassigned fund balance - Residual classification of the General Fund. This classification represents fund balance that has not been restricted, committed, or assigned specific purposes within the general fund.

G. Unpaid Compensated Absences

According to Commission policy each employee accrues annual leave based on years of service with the commission. Employees may accumulate a maximum of 30 days of unused annual leave, which is paid in cash upon termination of employment. The Commission's secretary may grant additional carryover to employees provided that: (1) the employee requests the carryover in writing prior to June 30, and (2) the employee uses the additional carryover within 90 days of the start of the fiscal year.

The Obligation for Compensated Absences has been broken down into two components; current and non-current. The current portion is classified as part of the general fund and is an estimate of the amounts that will be paid within the next operating year. The non-current portion is maintained separately and represents a reconciling item between the fund and government-wide presentations.

Note 2 - Stewardship, compliance, and accountability

Accounting and Reporting

The Commission is not required to report to any individual state or federal agency, other than for single audit when applicable. Financial reports are given to each Commissioner and is reviewed by them. The Commission is exempt from federal income tax reporting under 501(c) (1) of the internal revenue code.

Note 3 - Detail notes on all activities and funds

Deposits and investments

The Commissioners have authorized the Commission to deposit funds in demand accounts at Wells Fargo Bank and with the Utah Public Treasurers' Investment Pool. Following are discussions of the Commission's exposure to various risks related to its cash management activities.

Deposits

Custodial credit risk - Deposits. In the case of deposits, this is the risk that in the event of a bank failure, the government's deposits may not be returned to it. As of June 30, 2020, $105,163 of the bank deposits are insured, the remaining $913,352 balance of deposits was exposed to custodial credit risk because it was uninsured.

Investments

The Utah State Treasurer's Office operates the Public Treasurers' Investment Fund (PTIF). The PTIF is available for investment of funds administered by any Utah public treasurer and is not registered with the SEC as an investment company. The PTIF is authorized and regulated by the Money Management Act (Utah Code, Title 51, Chapter 7). The Act established the Money Management Council which oversees the activities of the State Treasurer and the PTIF and details the types of authorized investments. Deposits in the PTIF are not insured or otherwise guaranteed by the State of Utah, and participants share proportionally in any realized gains or losses on investments.

The PTIF operates and reports to participants on an amortized cost basis. The income, gains, and losses of the PTIF, net of administration fees, are allocated based upon the participant's average daily balance. The fair value of the PTIF investment pool is approximately equal to the value of the pool shares.

Fair Value of Investments - The Commission measures and records its investments using fair value measurement guidelines established by generally accepted accounting principles. These guidelines recognize a three-tiered fair value hierarchy, as follows:

Level 1: Quoted prices for identical investments in active markets;
Level 2: Observable inputs other than quoted market prices; and,
Level 3: Unobservable inputs.

	Measurement		
Investments by fair value level	Level 1	Level 2	Level 3
Utah Public Treasurers' Investment Fund	$ -	913,352	-
Total investments measure at fair value	$ -	913,352	-

- Utah Public Treasurers' Investment Fund: application of the June 30, 2020 fair value factor, as calculated by the Utah State Treasurer, to the Entity's average daily balance in the Fund.

Interest rate risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. The Commission's policy for managing its exposure to fair value loss arising from increasing interest rates is to invest only with the Utah PTIF.

As of June 30, 2019, the Commission's investments had the following maturities:
Investment Maturities (in years)

	Investment Maturities (in years)		
Investment Type	Less than 1	1-5	6 or more
Utah Public Treasurers' Investment Fund	$ 913,352	-	-
Total investments measure at fair value	$ 913,352	-	-

Credit risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The Commission's policy for reducing its exposure to credit risk is to comply with the State's Money Management Act, as previously discussed.

	Quality Ratings		
Investment Type	AA	A	Unrated
Utah Public Treasurers' Investment Fund	-	-	$ 913,352
Total investments measure at fair value	-	-	$ 913,352

Concentration of credit risk.

The Commission's investment in the Utah Public Treasurer's Investment Fund has no concentration of credit risk.

Custodial credit risk - Investments. For an investment, this is the risk that, in the event of the failure of the counterparty, the Commission will not be able to recover the value of its investments that are in the possession of an outside party. The Commission is authorized to invest in the Utah Public Treasurer's Investment Fund (PTIF), an external pooled investment fund managed by the Utah State Treasurer and subject to the Act and Council requirements. The PTIF is not registered with the SEC as an investment company, and deposits in the PTIF are not insured or otherwise guaranteed by the State of Utah. The PTIF operates and reports to participants on an amortized cost basis. The income, gains, and losses, net of administration fees, of the PTIF are allocated based upon the participants' average daily balances.

Components of deposits and investments (including interest earning deposits) at June 30, 2020, are as follows:

Cash on deposit	$ 105,163
Utah State Treasurer's Investment Pool	913,352
Restricted cash - SCPP	-
Total	$ 1,018,515

Capital Assets

Capital asset activity for the year ended June 30, 2020, is as follows:

	Balance at June 30, 2019	Additions	Disposals	Balance at June 30, 2020
Capital assets not being depreciated:				
Land	24,159	-	-	24,159
Total capital assets not being depreciated	24,159	-	-	24,159
Capital assets being depreciated:				
Building	85,055	-	-	85,055
Improvements	2,207	-	-	2,207
Furniture & Equipment	82,084	2,386	-	84,470
Total capital assets being depreciated	169,346	2,386	-	171,732
Less accumulated depreciation for:				
Building	78,786	1,337	-	80,123
Improvements	2,207		-	2,207
Furniture & Equipment	82,084	2,372	-	83,071
Total accumulated depreciation	161,692	3,709	-	165,401
Total capital assets, being depreciated, net	7,654	(1,323)	-	6,331
Capital assets, net	31,813	(1,323)	-	30,490

Depreciation expense of $3,709 was charged to the general administration activity of the Commission.

Note 4 - Other notes

Employee Retirement Plan

The Commission's employee pension plan is a 401(K) defined contribution plan which covers all of the present employees. The Commission contributes 7% of the employees' gross salaries. In addition, the Commission will match contributions made by employees up to a maximum of 3%. Accordingly, the maximum allowable contribution by the Commission is 10%. The employees are allowed to contribute up to the maximum allowed by law. The employer's share of the pension plan contribution for the year ended June 30, 2020 was $25,818.

Risk Management

The Commission is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; and natural disasters for which the government carries commercial insurance.

Subsequent Events

Subsequent events have been evaluated through September 3, 2020 the date the financial statements were available to be issued. There have been no subsequent events that provide additional evidence about conditions that existed at the date of the balance sheet.

Supplemental Schedules

Upper Colorado River Commission
General Fund
Supplemental Schedule of Cash Receipts and Disbursements
For the Year Ended June 30, 2020

Cash at June 30, 2019			$ 855,580
Cash Receipts:			
	Assessments	602,688	
	Interest	19,561	
	Grant – NM	15,000	
	Grant – Federal	3,147	
			640,396
Cash Disbursements:			
	Personal Services	387,466	
	Travel	29,111	
	Current Operating	45,301	
	Capital Outlay	11,933	
	Contingency	3,650	
			477,461
Cash at June 30, 2020			$ 1,018,515

Upper Colorado River Commission
General Fund
Detail of Personal Services and Current Operating Expenditures – Budget to Actual (Accrual Basis)
For the Year Ended June 30, 2020

Summary of Personal Services with Budget Comparisons	Budget	Actual	Variance w/Final Budget
Salaries/wages	$ 301,519	276,719	24,800
Social security	19,751	21,023	(1,272)
Pension fund contributions	26,418	25,568	850
Employee medical insurance	78,696	70,637	8,059
	$ 426,384	393,947	32,347

Summary of Current Operating Expenditures with Budget Total Comparison			
Audit and accounting	$ 6,700	5,261	1,439
Building repair & maintenance	5,300	2,665	2,635
Insurance	3,600	2,024	1,576
Janitorial	2,000	1,140	860
Library	5,000	3,530	1,470
Meetings, including reporter	3,200	603	2,597
Memberships and registrations	3,400	3,519	(119)
Office supplies and postage	3,600	3,910	(310)
Printing	4,800	4,022	778
Telephone	5,700	5,881	(181)
Utilities	5,500	4,226	1,274
	48,800	36,781	12,019

Other Reports

INDEPENDENT AUDITORS' REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

The Commissioners of the
Upper Colorado River Commission
Salt Lake City, Utah

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards issued by the Comptroller General of the United States, the financial statements of the governmental activities of the Upper Colorado River Commission, as of and for the year ended June 30, 2020, which comprise Upper Colorado River Commission's basic financial statements and have issued our report thereon dated September 3, 2020.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered Upper Colorado River Commission's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of Upper Colorado River Commission's internal control. Accordingly, we do not express an opinion on the effectiveness of Upper Colorado River Commission's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or, significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether Upper Colorado River Commission's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with Government Auditing Standards in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Ulrich & Associates, P.C.

Ogden, Utah
September 3, 2020

Upper Colorado River Commission

APPENDIX B
Budget

For the Fiscal Year Ending
June 30, 2021

APPROVED FY2020 BUDGET
UPPER COLORADO RIVER COMMISSION
Fiscal Year ending June 30, 2021

Approved on May 19, 2020

Personnel Costs inc. Pension, Social Security, and Benefits	**$**	**435,309.00**
Travel	$	41,000.00
Current Expense	$	50,270.00
Capital Expenses	$	5,500.00
Contingency	$	6,000.00
Transfer of Carryover to Operating Expense	$	(2,331.00)
Total	**$**	**535,748.00**
2021 State Assessments		
Colorado - 51.75%	$	277,250
New Mexico - 11.25%	$	60,272
Utah - 23%	$	123,222
Wyoming - 14%	$	75,005
Total	**$**	**535,748.00**

Upper Colorado
River Commission

APPENDIX C
Resolutions

For the Water Year Ending
Sept. 30, 2020

RESOLUTION
of the
UPPER COLORADO RIVER COMMISSION
HONORING L. JAMES EKLUND

WHEREAS, L. James Eklund was appointed by Governor John Hickenlooper in February 2015 to serve as Colorado's Commissioner on the Upper Colorado River Commission (Commission); and

WHEREAS, Mr. Eklund ably served the Commission until August 2019; and

WHEREAS, Mr. Eklund's first exposure to the importance of water was as a young boy working on his family's 131 year-old cattle ranch on a tributary to the Colorado River on Colorado's Western Slope;

WHEREAS, Mr. Eklund has had an esteemed career as an attorney in private practice, as well as a public servant for the state of Colorado, concentrating his professional pursuits on water management and policy;

WHEREAS, Mr. Eklund was the Director of the Colorado Water Conservation Board at the time of his appointment to the Commission;

WHEREAS, prior to his appointment, Mr. Eklund represented Colorado as a legal adviser to the Commission in his capacity as an Assistant Attorney General to the Colorado Attorney General;

WHEREAS, Mr. Eklund is currently of counsel for the global law firm of Squire, Patton and Boggs, P.C., where he serves as lead water counsel;

WHEREAS, for more than 4 years, Mr. Eklund served Colorado and the Commission in matters related to the conservation, use and development of the water and related resources of the Upper Colorado River Basin;

WHEREAS, during his service to the Commission, Mr. Eklund demonstrated his leadership on several critical components of the Law of the River, including participation in actions related to the execution of domestic

agreements required for the implementation of Minute 323 to the 1944 United States-Mexico Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande; the implementation of the four-year Upper Basin System Conservation Pilot Program; the finalization of the Upper Basin Drought Contingency Plan.

WHEREAS, as the result of the professionalism and sound judgment demonstrated by Mr. Eklund in his service to the Commission, the state commissioners, their advisers and Commission staff are grateful to consider Mr. Eklund a friend and colleague whose absence on the Commission will be missed;

NOW, THEREFORE, BE IT RESOLVED that the Upper Colorado River Commission, at its meeting held in Las Vegas, Nevada on December 11, 2019, does hereby express its gratitude and appreciation for the service and wise counsel provided by L. James Eklund in addressing the many legal, technical and policy challenges confronting the Upper Colorado River Basin during his tenure;

BE IT FURTHER RESOLVED that the Upper Colorado River Commission, its advisers and staff wish L. James Eklund, his wife Sara and their three children much happiness and success in their future endeavors; and,

BE IT FINALLY RESOLVED that the Executive Director of the Upper Colorado River Commission is hereby directed to transmit copies of this Resolution to L. James Eklund and to the Governor of the State of Colorado.

PATRICK T. TYRRELL
Commissioner for Wyoming

ERIC L. MILLIS
Commissioner for Utah

REBECCA MITCHELL
Commissioner for Colorado

JOHN R. D'ANTONIO
Commissioner for New Mexico

RESOLUTION
of the
UPPER COLORADO RIVER COMMISSION
HONORING ERIC KUHN

WHEREAS, Eric is well known to many for his decades of experience addressing and solving Colorado River Basin issues and priorities in a variety of roles; and

WHEREAS, Eric served at the Colorado River Water Conservation District from 1981 to 2019, first as their Assistant Secretary-Engineer, and then as General Manager for twenty-two years; and

WHEREAS, from 1994 to 2001, he served on the Colorado Water Conservation Board representing the Colorado River mainstem; and

WHEREAS, Eric was appointed in 2005 by Governor Owens to be an at-large representative on the Colorado Inter-basin Compact Committee and served in that capacity for 13 years; and

WHEREAS, Eric first joined the Engineering Advisory Committee of the Upper Colorado River Commission in 1982 and has served as its Chair since 2014; and

WHEREAS, Eric was instrumental in helping to identify mechanisms for the Upper Basin States to utilize Upper Colorado River Basin Funds for important and needed water development projects; and

WHEREAS, Eric in his capacity of General Manager of the River District, provided funding and resources to the States of the Upper Division for technical modeling and scenario planning, which greatly increased the Basin's understanding of the impacts of various management options on Colorado River resources; and

WHEREAS, Eric has a deep understanding of the Colorado River's history and hydrology and is a celebrated author and presenter on operations, future scenarios, and historical aspects of the Colorado River Basin;

NOW, THEREFORE BE IT RESOLVED that the Upper Colorado River Commission, at its meeting held in Las Vegas, Nevada on December 11, 2019, does hereby express its gratitude and appreciation for the dedicated service and depth of knowledge provided by Eric Kuhn in addressing the many technical and policy-related challenges the Upper Colorado River Basin has faced during his tenure; and

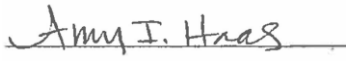
BE IT FURTHER RESOLVED that the Upper Colorado River Commission, its advisers and staff wish Eric Kuhn, and his wife Sue, and their family (including their beloved daughters Hallie and Kenzie) every happiness and the best of health in their future endeavors; and

BE IT FINALLY RESOLVED that the Executive Director of the Upper Colorado River Commission is directed to transmit copies of this Resolution to Eric Kuhn and to the Executive Director of the Colorado Department of Natural Resources and the Executive Director of the Colorado River Water Conservation Board.

CERTIFICATE

I, AMY I. HAAS, Executive Director and Secretary of the Upper Colorado River Commission, do hereby certify that the above Resolution was unanimously adopted by the Upper Colorado River Commission at its Meeting held in Las Vegas, Nevada on December 11, 2019.

WITNESS my hand this __11__ day of December, 2019.



AMY I. HAAS

Executive Director and Secretary

RESOLUTION
of the
UPPER COLORADO RIVER COMMISSION
HONORING ERIC MILLIS

WHEREAS, Eric Millis was appointed by Governor Gary Herbert in October 2013 to serve as Utah's Commissioner on the Upper Colorado River Commission (Commission); and

WHEREAS, Mr. Millis ably served the Commission until his retirement in December 2019; and

WHEREAS, Mr. Millis also served as the Director of the Utah Division of Water Resources (Division) during his tenure on the Commission; and

WHEREAS, Mr. Millis had an esteemed career as a civil engineer, working/or nearly 32 years with the Division on a variety of projects to support Utah's water resources, including the Colorado River; and

WHEREAS, in his capacities as both Utah Commissioner and Division Director, Mr. Millis was recognized for his expertise on Colorado River issues; and

WHEREAS, for more than 6 years, Mr. Millis served Utah and the Commission in mailers related to the conservation, use and development of the water and related resources of the Upper Colorado River Basin; and

WHEREAS, during his service to the Commission, Mr. Millis demonstrated leadership on several critical components of the Law of the River, including participation in actions related to the execution of domestic agreements required for /he implementation of Minute 323 to the 1944 United States-Mexico Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande; the implementation of the four-year Upper Basin System Conservation Pilot Program; and, the finalization of the Upper Basin Drought Contingency Plan; and Interior.

WHEREAS, during Mr. Millis' tenure on the Commission, he served as the Chair of its Budget Committee and Co-Trustee of the Commission 401k pension plan; and

WHEREAS, as the result of the professionalism and excellent judgment demonstrated by Mr. Millis in his service to the Commission, the state commissioners, their advisers and Commission staff are grateful to consider Mr. Millis a friend and valued colleague whose absence on the Commission will be missed.

NOW, THEREFORE, BE IT RESOLVED That the Upper Colorado River Commission, at its meeting held on May 19, 2020, does hereby express its gratitude and appreciation for the service and wise counsel provided by Eric Millis in addressing the many technical and policy challenges confronting the Upper Colorado River Basin during his tenure;

BE IT FURTHER RESOLVED that the Upper Colorado River Commission, its advisers and staff wish Eric, his wife Lynn, their five children, and five grandchildren much joy and happiness in the future, as well as ample time for Eric to enjoy woodworking and canoeing, among his other hobbies; and,

BE IT FINALLY RESOLVED That the Executive Director of the Upper Colorado River Commission is hereby directed to transmit copies of this Resolution to Eric Millis and to the Governor of the State of Utah.

PATRICK T. TYRRELL
Commissioner for Wyoming

TODD D. ADAMS
Commissioner for Utah

REBECCA MITCHELL
Commissioner for Colorado

JOHN R. D'ANTONIO
Commissioner for New Mexico

RESOLUTION
of the
UPPER COLORADO RIVER COMMISSION

December 11, 2019

WHEREAS, the Upper Colorado River Commission (Commission) maintains a 401(k) Profit Sharing Plan (Pension Plan) to provide its employees with retirement benefits; and

WHEREAS, the Commission's Executive Director, Amy Haas, who also serves as Secretary and Treasurer, and the Chairperson of the Commission's Budget Committee, Eric Millis, currently serve as Trustees of the Pension Plan; and

WHEREAS, on August 25th, 2017, the Commission adopted a resolution naming Ms. Haas and Mr. Millis Co-Trustees of the Pension Plan; and

WHEREAS, the Deputy Director of the Commission has historically served as a Co-Trustee of the Pension Plan, together with the Chairperson of the Budget Committee; and

WHEREAS, Executive Director Haas assumed the role of Co-Trustee of the Pension Plan when she became the Commission's Deputy Director in 2017; and

WHEREAS, Executive Director Haas retained the role of Co-Trustee of the Pension Plan when she was promoted in 2018 to the Executive Director position and while the Commission Deputy Director position was vacant; and

WHEREAS, Sara Larsen became Deputy Director and Assistant Treasurer of the Commission on July 1, 2019; and,

WHEREAS, the Commission seeks to designate Pension Plan Trustees based on roles and service to the Commission position, rather than by individual name;

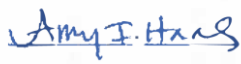
NOW, THEREFORE, BE IT RESOLVED that by virtue of their respective positions and roles for the Commission, the Deputy Director and Chair of the Budget Committee will jointly act as Trustees of the Pension Plan;

BE IT FURTHER RESOLVED that the Trustees be, and hereby are, authorized and directed to take any and all actions, and execute and deliver such documents as they deem necessary or appropriate, to effect the foregoing resolution.

CERTIFICATE

I, AMY I. HAAS, Executive Director and Secretary of the Upper Colorado River Commission, do hereby certify that the above resolution was unanimously adopted by the Upper Colorado River Commission at its Meeting held in Las Vegas, Nevada on December 11th, 2019.

WITNESS my hand this _11_ day of December, 2019.



AMY I. HAAS
Executive Director and Secretary

Upper Colorado
River Commission

APPENDIX D
Transmountain Diversions

For the Water Year Ending
Sept. 30, 2020

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN IN COLORADO (2011 – 2020)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	10-YEAR AVERAGE
TO PLATTE RIVER BASIN											
Grand River Ditch	17,080	9,832	17,692	15,490	12,641	14,070	15,915	7,244	9,712	18,094	13,777
Eureka Ditch	0	0	0	0	0	0	0	0		0	0
Alva B. Adams Tunnel	247,800	292,314	237,200	203,300	113,014	242,900	241,335	116,939	289,300	210,493	219,460
Berthoud Pass Ditch	841	403	558	600	366	738	805	208	638	632	579
Moffat Water Tunnel	51,780	43,749	57,781	18,500	26,828	26,450	43,231	24,835	49,980	55,238	39,837
Boreas Pass Ditch	237	4	103	181	113	119	116	36	157	130	120
Vidler Tunnel	400	441	291	670	668	380	403	135	518	412	432
Harold D. Roberts Tunnel	79,310	115,972	84,842	13,550	8,870	37,470	92,227	46,646	48,110	66,035	59,303
Straight Creek Tunnel	347	183	225	322	291	265	256	102	263	236	249
TO ARKANSAS RIVER BASIN											
Hoosier Pass Tunnel	3,137	4,586	9,295	9,370	6,493	7,820	12,605	4,295	7,940	10,986	7,653
Columbine Ditch	230	673	1,350	2,408	1,348	926	1,860	1,320	2,620	1,452	1,419
Ewing Ditch	1,492	257	769	1,553	711	466	1,080	524	1,920	658	943
Wurtz Ditch	3,246	803	1,639	3,398	499	1206	2,340	1,380	3,750	2,012	2,027
Homestake Tunnel	32,231	43,350	19,495	17,771	4,185	2,143	22,600	19,430	34,040	23,831	21,908
Twin Lakes Tunnel	66,326	23,250	37,782	62,747	17,650	17,814	31,570	31,060	37,910	36,540	36,265
Charles H. Boustead Tunnel	99,804	13,960	47,019	81,010	70,731	31,366	70,080	40,930	97,200	53,240	60,534
Busk-Ivanhoe Tunnel	4,039	2,990	4,128	5,852	2,554	2,400	2,920	1,550	4,260	3,250	3,394
Larkspur Ditch	310	48	64	305	517	177	503	101	403	271	270
TO RIO GRANDE BASIN											
Tarbell Ditch	578	185	424	920	0	0	479	162	2	319	307
Tabor Ditch	591	347	361	1,020	1,387	1,020	1,020	259	1,260	588	785
Treasure Pass Ditch	262	213	180	245	303	319	458	155	440	212	279
Don La Font Ditches No. 1 & 2	296	184	309	229	309	347	371	45	213	87	239
Williams Creek-Squaw Pass Ditch	395	337	296	384	517	318	448	184	356	281	352
Pine River-Weminuche Pass Ditch	307	244	525	448	934	639	593	163	444	479	478
Weminuche Pass Ditch	229	219	718	1,270	2,918	2,020	1,440	322	752	877	1,076
TOTAL	611,266	554,545	523,046	441,543	273,849	391,373	544,655	298,025	592,188	486,353	471,684

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN IN COLORADO TO RIO GRANDE BASIN IN NEW MEXICO (2011 – 2020)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	10-YEAR AVERAGE
San Juan-Chama Diversions	92,826	51,775	40,953	61,963	94,048	94,310	163,168	36,511	139,062	45,071	81,969

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN TO THE GREAT BASIN IN UTAH (2011 – 2020)

Broadbent Supply Ditch (Wyoming)	367	377	507	830	1,000	1,061	1,240	1,734	1,515	840	947
Fairview Tunnel	2,032	2,175	1,881	2,078	1,332	2,241	2,550	716	2087	1366	1,846
Ephraim Tunnel	1,522	2,145	1,742	2,678	3,412	1,621	2,450	1,493	1,829	2,078	2,097
Spring City Tunnel	4,908	3,421	4,023	4,344	4,171	3,736	4,656	2,223	3,833	3,000	3,831
Central Utah Project, Bonneville Unit*	39,780	27,817	36,437	43,815	44,345	41,982	29,410	34,962	46,715	49,284	39,455
Hobble Creek Ditch	0	0	0	0	0	0	0	0	0	0	0
Strawberry-Willow Creek Ditch	0	0	0	0	0	0	0	0	0	0	0
Strawberry Water Users Association*	38,418	71,817	69,600	60,723	63,264	63,499	55,549	74,796	42,479	71,998	61,214
Duchesne Tunnel	10,581	20,712	24,144	42,769	29,638	35,577	37,561	24,314	36,431	32,996	29,472
TOTAL	97,607	128,463	138,334	157,238	147,163	149,717	133,417	140,238	134,889	161,562	138,863

TRANSMOUNTAIN DIVERSIONS FROM GREAT BASIN IN UTAH TO COLORADO RIVER BASIN IN UTAH (2011 – 2020)

Tropic and East Fork Canal	4,667	5,100	5,640	3,115	4,444	9,648	4,916	4,834	5,000	4,800	5,216

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN TO NORTH PLATTE BASIN IN WYOMING (2011 – 2020)

City of Cheyenne	5,262	5,754	12,784	8,063	5,945	7,553	5,673	6,170	14,500	7,660	7,936

ALL TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN (2011 – 2020)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	10-YEAR AVERAGE
TOTAL	805,395	738,537	712,577	668,791	519,660	636,405	845,097	479,210	878,739	698,946	698,268