Minutes of Meeting
COLORADO RIVER BOARD OF CALIFORNIA
Wednesday, December 10, 2014

A meeting of the Colorado River Board of California was held on Wednesday, December 10, 2014.

Board Members and Alternates Present

Stephen Benson
Dana Bart Fisher, Jr., Chairman
Glen Peterson
David Pettijohn
John Powell Jr.
Jack Seiler
Michael Touhey
Doug Wilson
Jeanine Jones, Designee
Department of Water Resources
Chris Hayes, Designee
Department of Fish and Wildlife

Board Members and Alternates Absent

James Hanks
James McDaniel

Others Present

Steve Abbott
Tim Blair
Gary Bryce
Brenda Burman
Lori Caramanian
John Carter
Robert Cheng
Michael Clinton
Harvey Delatorre
Dan Denham
Ron Derma
Terry Fulp
Kris Fontaine
Jennifer Gimbel
Jennifer Goodsell
Mary Halverson
Christopher Harris
Joanna Hoff
Andy Horne
Michael Hughes
Lori Jones
Jan Matusak
Bob Muir
Jerry Nakasawa
Peter Nelson
Jessica Neuwerth
Antonio Ortega
Lowell Pimley
Autumn Plourd
Larry Purcell
Randy Burman
Brent Rheese
Eric Ruckdaschel
Harry Ruzgerian
Tom Ryan
Jack Seiler
Laura Simonek
Ed Smith
Rodney Smith
Rob Thomson
Sean Torpey
Michael Touhey
Camille Touton
David Vigil
Jerry Zimmerman

CALL TO ORDER

Chairman Fisher announced the presence of a quorum and called the meeting to order at 3:05 p.m.

OPPORTUNITY FOR THE PUBLIC TO ADDRESS THE BOARD

Chairman Fisher asked if there was anyone in the audience who wished to address the Board on items on the agenda or matters related to the Board. Hearing none, Chairman Fisher moved to the next agenda item.

Ms. Trujillo identified notable members of the federal government that were present at the meeting. The names included: Deputy Assistant Secretary for Water and Science Jennifer Gimbel, Deputy Commissioner Lowell Pimley who was Acting Commissioner before Estevan Lopez became appointed as the Principal Deputy Commissioner at Reclamation, Upper Colorado Deputy Regional Director Brent Rheese, Lower Colorado Regional Director Terry Fulp, Deputy Assistant Secretary for Water and Science Lori Caramanian, and counselor to the Assistant Secretary for Water and Science Camille Calimlim Touton.

Ms. Jennifer Gimbel introduced herself and briefly discussed her professional background and her new role as Deputy Assistant Secretary for Water and Science.

ADMINISTRATION

Approval of Minutes of the November 19, 2014 Colorado River Board Meeting

Chairman Fisher asked if there was a motion to approve the November 19, 2014 minutes. Mr. Benson moved that the minutes be approved, seconded by Mr. Powell. By unanimous support, the November 19, 2014 meeting minutes were approved.

Approval of the 2015 Board Meeting Schedule

Chairman Fisher asked if there was a motion to approve the 2015 Board Meeting Schedule. Mr. Benson moved that the 2015 Meeting schedule be approved, seconded by Mr. Powell. By unanimous support, the 2015 Board Meeting Schedule was approved.

Report from Terry Fulp, Lower Colorado Regional Director, U.S. Bureau of Reclamation

Dr. Terry Fulp, Regional Director of U.S. Bureau of Reclamation's (Reclamation) Lower Colorado Region, thanked the Colorado River Board for the invitation to speak and began by stressing the importance of bringing on the next generation of employees for succession planning. He added that the collaborative success within the Colorado River basin over the years has been fundamentally driven by relationships and we need to strive to continue working on building relationships.

Dr. Fulp reflected over the past 15 years and said that the average natural inflows into Lake Powell during this period have been the lowest in recorded history, and one of the lowest within the 1,200 year reconstructed tree-ring record for hydrology. However, the climate models indicate that it is between the 20th and 30th percentile of the lowest, which would classify the last 15-year period as a severe drought that would require coordinated activities among stakeholders to combat and mitigate its potential impacts.

Dr. Fulp explained that there is always variability in the hydrology. The Colorado River basin is unique because the total storage is about four times larger than the average annual inflows. The total system is at about 50% of capacity at this time, while Lake Mead is at about 39% of capacity. During the last 15 years, the system has fluctuated between about 50% to nearly full at 95% capacity during this current drought period. The system is resilient because of the ability to store water during periods of high flows and use the water in times of dry periods.

Lake Powell is expected to release 9 million acre-feet (MAF) of water this year. But last year for the first time since filling, Lake Powell released less than the minimum objective amount of 8.23 MAF. About 750,000 acre-feet (AF) were withheld from release to protect the elevation at Lake Powell as Lake Mead was allowed to continue to decline. Now that the elevation at Lake Powell has improved since last year, water may be released down to Lake Mead per the 2007 Interim Guidelines. Mr. Fulp said that after eight years of implementing the 2007 Interim Guidelines, stakeholders must continue to work hard at implementation of the Guidelines. The drought contingency planning efforts among the Lower Basin states include voluntarily and proactively storing water at Lake Mead to minimize the risks of shortages and ensuring the viability of the 2007 Interim Guidelines through 2026.

Dr. Fulp then proceeded to respond to several questions Ms. Trujillo had asked before the meeting. The first question was about the threat to Basin states, particularly California, from the current drought. One of the main objectives of the drought contingency plan is to reduce the risk of Lake Mead reaching critical water surface elevations. The risks are assessed by evaluating the storage capacity at a given elevation. For example, there would only be 4 MAF remaining when Lake Mead is at a water surface elevation of 1,000 feet. So the risks of being at this critical elevation could potentially affect all stakeholders because even the present perfected rights could not be met.

The second question related to the structural imbalance, or structural deficit, particularly around Lake Mead. Dr. Fulp believed the situation is more accurately called an imbalance. Given that Lake Powell releases 8.23 MAF to Lake Mead, full entitlements in the Lower Basin, plus Mexico obligations, and gains and losses, result in an annual deficit in Lake Mead storage of 1 to 1.2 MAF. Using the rule of thumb that 100,000 AF translates to about 1 foot of surface water in elevation at Lake Mead, that would create a decline in elevation of 10 to 12 feet of water annually. The other scenario is when there are high inflows and corresponding improved storage. Lake Powell operates to release more water to the Lower Basin, which is also known as the

equalization tier that was defined in the 2007 Guidelines. The last time such high inflows occurred was in the late-1990s. Dr. Fulp said that if the hydrology does not improve and Lake Powell continues to release 8.23 MAF or less, then stakeholders must be very proactive to at least reduce the decline of Lake Mead. The purpose of the drought contingency plan would do just that by creating storage in Lake Mead and reducing the risks of elevations reaching critical levels.

Another item Dr. Fulp addressed was the drought contingency planning Memorandum of Understanding among Reclamation and various stakeholders. He explained that Reclamation would use its best efforts to create 50,000 AF of water in Lake Mead. Dr. Fulp explained that this savings would be achieved by "tightening the system" through improvements in operational efficiency particularly in the Lower Basin. Brock Reservoir is an example of a success story that resulted from collaboration and cost sharing. Jennifer McCloskey will present data related to the positive impacts of operations at Brock Reservoir. Senator Wash Reservoir is also being operated to help achieve the goal of creating 50,000 acre-feet of additional storage in Lake Mead.

Another area of potential operational improvement is in addressing the bypass flows, which are those flows that cross the international border to help meet the salinity differential in Mexico. This was mandated in the 1970s with Minute 242 and the Salinity Control Act. The bypass flows are not counted against the treaty obligations to Mexico. Reclamation will be studying options to manage the bypass flows while still meeting commitments to Mexico and ensuring that the Cienega de Santa Clara wetlands remain viable.

Mr. Peterson asked if Reclamation has any plans to restart the Yuma desalination unit. Dr. Fulp said that the idea is certainly being considered but it is an old plant and would need safety and technology upgrades.

Chairman Fisher thanked Dr. Fulp for his hard work and efforts as a federal partner with the Board in advancing Colorado River issues.

Report from Don Barnett, Executive Director, Colorado River Salinity Control Forum

Mr. Barnett concentrated his presentation on issues relating to the Paradox Valley Salinity Control Unit and provided background information and gave an update on current operations, the preparation of the Environmental Impact Statement (EIS)/Alternative Study, and the Contingency Plan associated with the Unit. Mr. Barnett described the La Sal Mountains as the recharge area for the Paradox Valley. As the river continues its course perpendicular to the valley, the salt dome collapsed and the salts dissolved out, forming the Paradox Valley. As recharged water from the La Sal Mountains flows down the valley, it is intercepted by the Dolores River. With salinity of 250,000 milligrams per liter (mg/L) of water discharging into the banks of the Dolores River, about 200,000 tons of salt flowed into the river historically each year.

In the 1970s, Reclamation issued a report to develop wells to capture up to 5 cfs of brine before it discharged into the river and dispose of it in a 3,600 acre-foot reservoir evaporation pond. The report estimated the project would capture 88% of the salt being discharged or 180,000 tons per year, reducing the downstream concentration by about 18 mg/L. The Environmental Protection Agency (EPA) in response to Reclamation's report highlighted five environmental concerns, one of which remains the driving issue in the current EIS. EPA asked Reclamation to look into deep well injection as a disposal method. Reclamation drilled a deep injection well and shallow wells as a demonstration project. The project was later converted to a permanent facility with a plan to capture about 2 cfs of brine, disposing it via a 16,000-foot deep injection well, believed to be the deepest injection well in the world, and reducing the salt load by 64%. At the time, the facility was estimated to save about $43 million annually in downstream damages. Reclamation constructed the treatment and injection facilities, and ultimately the deep injection well. Mr. Barnett described that the brine is injected into the Leadville Limestone formation, starting at about 14,000 feet deep. Currently, the down-hole injection pressure is more than 6,000 psi greater than up-hole. More full-scaled operations occurred in 1996. The initial effort of the first phase of the project was to run two to three of the injection pumps continuously, holding the up-hole injection pressure at the maximum allowable of 5,000 psi under the EPA permit. Then the occurrence of an earthquake revamped the operation with several shutdown periods annually to alleviate pressure buildup. Another earthquake scaled the injection rate back to 230 gallons per minute along with two 20-day shutdown periods. Initially, the project was injecting a mix of 30% freshwater and 70% brine. Phase IV that has been ongoing for the past ten years and 100% brine has been injected at the rate of 230 gallons per minute, shutting down twice a year to ease off the pressure. About two million tons of salt have been disposed of using this method. Mr. Barnett explained that 126,000 tons per year of salt were disposed in the first phase of the project. Until recently, the disposal rate is approximately 112,000 tons per year. There has been an increase of up-hole pressures throughout the whole process and the maximum pressure allowed by the EPA was reached several years ago. Reclamation consulted with EPA and had the maximum allowable pressure increased to 5,350 psi.

Mr. Barnett explained that the operation was going smoothly until a Magnitude 4.4 earthquake shook the community of Paradox, Colorado. Several thousand earthquakes had been induced through the injection wells and two of the earthquakes had a magnitude greater than 4.0. But the concerning issue with this earthquake was that it did not occur close to the injection well but about 6 kilometers northwest of the well. Following protocol, Reclamation shut down the well and examined the facilities with assistance from its seismologists. A new protocol was proposed to reduce the injection rate another 10% and the shutdown period changed from twice a year to once a week for 18 hours to allow the pressures to bleed off. The well is currently injecting about 102,000 tons per year. With the new protocol in place, the total pressure increase during the past year was only 2 psi greater than it was at the beginning of the year. And with only 45 seismic events this year and the largest one a Magnitude 2.3, the situation at the Paradox Unit well does not seem as urgent as a couple of years ago.

In regards to the EIS, Mr. Barnett explained that Reclamation recognized several years ago the need to look at another disposal alternative as the life of the well is coming to an end. Reclamation hired a consortium to look into the alternatives. The consortium developed 16 alternatives, most of which were aimed at reduction of brine to be disposed. Some of the alternatives were looking at actual disposal opportunities. The main alternatives identified are a second injection well or an evaporation pond, and if an evaporation pond is built, whether it needs to be netted to prevent impacts to wildlife. The states requested that Reclamation do a pilot evaporation pond study because of the states' concern that evaporation ponds were not fairly considered in the first round of identifying alternatives. The pilot evaporation pond study would add another 2 or 3 years and about $10 million. Mr. Barnett reported that the EIS should be completed in the first quarter of FY 2018. Reclamation has been using year-end dollars to do the work but the funding would be more critical next year as the majority of the work will be done in FY 2016.

Mr. Barnett explained that most of the analysis is being done through a Contractor Review Board process, where a facilitator would bring in experts from the field and have them analyze various aspects of the project and write a report. There is currently a Contractor Review Board looking at evaporation pond options, and another Review Board will be looking at a second well site in the near future.

Mr. Barnett reported that the Salinity Forum's Management Committee was able to meet with Reclamation last week to voice its concerns about the schedule of the project. Reclamation expressed concerns about the permitting and the environmental issues if the preferred alternative is evaporation ponds. Mr. Barnett reiterated that the main decisions are whether to do a second injection well or evaporation ponds and it is important to understand the issues upfront. For a second injection well, it would be critical to understand the ideal sites for a well and what the issues might be. One issue would be if directionally drilling from the current site, which is desirable because of the environmental advantages, is technically feasible. If not, a second well may have to be relocated in the valley, up the canyon, or even on the other side of the valley. For the evaporation ponds, the Intrepid ponds near Moab, Utah, that are evaporating salt are an option that is being considered for study. In addition, Reclamation is sending out a Request For Proposals to the commercial sector to see if there is interest in contracting for disposal of the salt.

Mr. Barnett reported that three years ago Reclamation began its emergency action plan, which was intended to be a plan on how the states would work with congressional delegations if the Paradox Valley Unit fails, which generated a misunderstanding that Reclamation has a plan ready for the 100,000 tons of salt to be disposed elsewhere if the well fails. Mr. Barnett explained that Reclamation receives an appropriation of about $7 million a year, coupled with $3 million in cost share, for a total of $10 million a year under its Basin-wide program. This amount buys about 8,000 tons of new salinity control every year. The Paradox Valley Unit is thus worth about 12.5 years of salinity control work, which is a very cost-effective program. Reclamation does not have 12.5 years worth of funding or work that could be immediately taken up if the injection well fails.

Reclamation will be working with the states over the next several months to develop a plan to fast track the EIS process and cover issues such as the cost of a second well and netted evaporation pond, which could easily double the cost of a pond that is not netted. Other issues include the need for permits, land acquisitions and working with the congressional delegations to secure federal funding if emergency action is needed. There is also a need for program design dollars within Reclamation's budget to move the project ahead. In terms of states' cost share, there is a need to identify whether it will be upfront cost share or repayment in order to move the project along.

Board Member Wilson asked Mr. Barnett to clarify the definition of the end of the well's useful life and if it is related to the capacity of the well. Mr. Barnett explained that it was initially defined as when the well exceeds its maximum allowable pressure permitted by the EPA. Although it is physically operational, the Paradox Valley well may ultimately have to shut down due to the seismic activities. Seismologists have warned that Reclamation may have already been injecting the brine that is going to cause a large earthquake in the future. Mr. Barnett stated that Reclamation is monitoring the effects of the regime change, but if an earthquake adversely impacts the town of Paradox, Reclamation may have to decide to ultimately shut down the well.

Mr. Wilson asked what would happen if the well were to fail tomorrow. Mr. Barnett responded that a second well site would have to be funded and permitted immediately. A second well may not be the best alternative, but it would be the quickest. EPA could fast-track the Underground Injection Control (UIC) permit. The location of the well would depend on whether Reclamation would have to do an environmental assessment. Reclamation would need to find $50 to $80 million for the second well. Board member Peterson suggested that the concerns about earthquake-induced failure of the wells may be overblown as earthquakes occur frequently but reported damage has not been significant that he's aware of. Mr. Peterson agreed that replacing the injection well is important but asked about the cost of the evaporation ponds. Mr. Barnett explained that Reclamation sought initial input from various agencies, and the U.S. Fish and Wildlife Service was concerned with potential impact of the ponds on migratory birds. There was also concern that expensive liners would have to be installed to prevent contamination of the local groundwater. These are some of the environmental issues Reclamation would have to work through.

Mr. Pettijohn asked about the impact of a reduced injection rate on the salinity of the Colorado River. Mr. Barnett responded that Reclamation is working with MWD to model a worse case scenario on the salinity impact of the well's failure. Mr. Barnett estimated that the salinity concentration in the Colorado River would increase by 10 mg/L if 100,000 tons if salt is not captured at $2 to $3 million in potential damages per mg/L increase in concentration.

Chairman Fisher thanked Mr. Barnett for his presentation.

COLORADO RIVER BASIN PROGRAM REPORTS

"Year-in-Review" Presentation

Ms. Trujillo reported that the Upper Colorado River Commission signed a resolution highlighting weather modification activities and reservoir operations, which they are seeking more flexibility with. The effort is similar to the Memorandum of Understanding signed by the Lower Basin States to continue ongoing drought contingency planning efforts.

Ms. Trujillo provided the Board with a year-in-review presentation highlighting many of the programmatic developments that occurred in 2014. The review began with an overview of the Colorado River Basin Water Supply and Demand Study Next Steps Phase 1 process, which is nearly concluded. The Phase 1 process involved workgroup analysis of municipal and industrial conservation, agricultural conservation and environmental and recreation flows. Ms. Trujillo reported that the report is in its final review process at the federal level in Washington, D.C. and should be available soon. Ms. Trujillo stated that the report will be reviewed for the Board in a future meeting and thanked the Board members and their agency staff for assisting with the Phase 1 process.

Regarding Minute 319, Ms. Trujillo stated that one of the biggest events from last year was the release of the pulse flow that began on March 23 and continued through May 18, 2014. Ms. Trujillo stated that more information regarding the monitoring plan and the results from the pulse flow would be available soon. She noted that the Board's Deputy Director Chris Harris would be moderating a panel about this topic as part of the CRWUA conference. Ms. Trujillo explained that the water used for the pulse flow would be taken out of Mexico's allocation and would be properly documented in the 2014 decree accounting report along with Mexico's normal annual diversions. Additional bi-national workgroup meetings are scheduled for mid-December in San Diego. Ms. Trujillo noted that Commissioners from the International Boundary Water Commission and Deputy Secretary of the Interior Mike Connor would be presenting on Minute 319 during the CRWUA conference and it would be important to observe their perspectives on the potential for continuation or revision of the pilot project, which is in place for five years.

Regarding the Salinity Control Program, Ms. Trujillo reported that one of the biggest accomplishments was the completion of the 2014 Triennial Review, which sets goals and standards for the next three years. Ms. Trujillo noted that the State of California's Water Resources Control Board would adopt the Triennial Review in the near future. The next Salinity Control Forum meeting will be hosted in California in February 2015. Don Barnett and the Workgroup Chair are working to develop informative presentations that document the impact that higher salinity levels will have on programs in the Basin, such as water recycling programs, which are susceptible to higher salinity levels. Higher salinity levels also detrimentally impact the agricultural industry and maintaining low salinity levels would benefit all water users in California.

Ms. Trujillo reported that one of the highlights of the Glen Canyon Dam Adaptive Management Program in 2014 was the third consecutive fall high-flow experimental release from Glen Canyon Dam, which took place in November. Additionally, the program continues to work towards completion of a new EIS for long-term operations. A draft EIS should be completed within the next several months with a final EIS expected by mid-2015.

Ms. Trujillo noted that the House and Senate recently approved the Bill Williams River Water Rights Settlement Act of 2014, which brings the Lower Colorado River Multi-Species Conservation Program (MSCP) closer to acquiring the Planet Ranch property. In 2014, the MSCP also identified and resolved an underfunding issue from fiscal years 2011-2014. Ms. Trujillo reported that the MSCP was waiting for the Fish and Wildlife Service's final critical habitat designation for the yellow-billed cuckoo, which was listed as threatened in October 2014. Finally, Ms. Trujillo highlighted the MSCP tour led by the Colorado River Authority in October 2014 and the upcoming 10-year anniversary tour planned for April 2015.

COLORADO RIVER BASIN WATER REPORTS & DROUGHT UPDATE

Colorado River Basin Water Report

Executive Director Trujillo reported that as of November 30, 2014, the water level at Lake Powell was at 3,602 feet with 11.93 million acre-feet (MAF) of storage, or 49% of capacity, while the water level at Lake Mead was at 1,084 feet with 10.31 MAF of storage, or 39% of capacity. The total System active storage is 29.74 MAF, or 50% of capacity, which is almost exactly the same as last year. As of December 1, 2014, the Upper Colorado River Basin reservoirs, other than Lake Powell, ranged from 65% to 96% of their capacities.

Ms. Trujillo noted that one of the Upper Basin states drought contingency planning strategies is to provide more operational flexibility by releasing water from some of the larger Upper Basin reservoirs to maintain Lake Powell's elevation. The higher elevation is critical for both delivery obligations to Lower Basin states and for power generation, which creates revenues for operational requirements and programs such as the Upper Colorado River Basin Recovery Program and Salinity Control Forum.

Mr. Peterson asked if there are any requirements for flood control in the Upper Basin and noted that Lake Oroville had to be lowered to create flood control space. Mr. Rhees confirmed that some flood control space-building releases are made such as from Flaming Gorge due to anticipated inflows.

Ms. Trujillo presented slides from the Colorado River Basin Forecast Center showing snowpack conditions. As of December 1st, the basin wide snow water equivalent is 95% of average. The monthly precipitation in October was below average, but showed improvement in November. Fifty-five percent of the state of California was in the exceptional drought category, which is the most severe category of drought.

State Report

Ms. Jones stated that we've had three consecutive dry years, but conditions have improved a little since the start of Water Year 2015. The first significant statewide precipitation occurred last week. There have been many news stories about huge storms striking Northern California but in reality one big storm will not end the drought. There would need to be a number of these storms before there is a possibility of ending the current drought. At this time in the Water Year, precipitation in Northern California is close to average.

Due to successive dry periods, statewide reservoir storage has dropped. At the beginning of this Water Year, statewide storage was at about 56%. Due to the low storage and water supply conditions, Ms. Jones reported that agencies are still preparing for the possibility of a dry 2015.

Local Report

Mr. Peterson reported on the status of MWD's storage conditions and commented that nothing much has changed from last month's report. Mr. Peterson noted that there has been $100 million and counting worth of reservations for grass removaland that the State Water Project (SWP) allocation has doubled from last year.

Mr. Pettijohn from LADWP showed a graph of the Mammoth Pass snowpack and mentioned that despite the recent big storms in California, the eastern side of the Sierra (part of Los Angeles Aqueduct watershed) did not receive much precipitation. This represents a good example of how one big storm does not end the drought (and precipitation did not occur where it was needed). As of December 9th, precipitation is at 15% of normal at 1.5 inches of water when typically we would average about 10 inches. Precipitation was not even at 50% of normal last year. The bottom line in the graph represents the 1976-1977 California drought (driest period). When the outlook for diversions from the LA Aqueduct is poor, LADWP would be more reliant on receiving water deliveries from the SWP. The 1982-1983 Water Year was the wettest year. Mr. Pettijohn commented that although we may be at 96% of normal, there are only a couple of inches of precipitation. It is still early in the Water Year, but the water content is very low in this watershed.

2014 California Drought Update

The emergency drought declaration is still in effect in California. With the passage of the $7.5 billion water bond, the process for appropriation and access of those funds would soon be better understood. Ms. Trujillo highlighted the announcement of the low 10% SWP allocation in 2015.

Ms. Jones reflected on the many different drought contingency plans being developed for California right now such as for the SWP operations, Delta operations, and

water transfers. Another plan that is being considered is forming a drought resiliency partnership (known as NDRIP) as a pilot project in California with federal partners.

Ms. Trujillo added that one of the handouts from National Oceanic and Atmospheric Administration (NOAA) was on the 2011 to 2014 drought. The U.S. Geological Survey has also developed a graphical depiction of the California drought.

Ms. Trujillo highlighted future uncertainties in hydrology, the recent Salton Sea petition filed by Imperial Irrigation District to the State Water Resources Control Board, and how the programs under the drought contingency plan will be developed.

Adjournment

With no further items to be brought before the Board, Chairman Fisher asked for a motion to adjourn the meeting. Upon the motion of Mr. Powell seconded by Mr. Peterson, and unanimously carried, the meeting was adjourned at 4:29 p.m. on December 10, 2014.