



## MEMORANDUM

July 4, 2011

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**TO:** BOARD OF DIRECTORS, CRWCD

**FROM:** ERIC KUHN

**SUBJECT:** *COLORADO RIVER WATER SUPPLY ISSUES*

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There are a number of parallel, but related studies and other efforts addressing water supply issues on the Colorado River.

### 1. Colorado River Water Availability Study (CRWAS)

AECOM completed the public draft of Phase I of the Colorado River Water Availability Study (CRWAS) in March 2010. Since that time, the Colorado River Water Conservation Board (CWCB) has taken a slow and deliberate approach toward accepting public comments and finalizing the draft report. The CWCB staff prepared a detailed public review plan. This plan included meeting with all nine basin roundtables. I believe the CWCB staff has now met with all four West Slope Roundtables.

The next step will be for the CWCB to direct AECOM as to how it wants to proceed with finalizing the Phase I report. It has to address a number of issues, both technical and political. The technical issues relate to the selection of five global circulation model runs (out of 112) for the 2070 hydrology. Should the 2070 results be redone with a new set of five models? Should the results be redone with more than five different models? Should the 2070 results be redone at all?

The political questions are related to how information related to compact questions is disclosed or perhaps the possibility of the information not being disclosed at all.

The CWCB has been under a lot of pressure from different parties to avoid directly answering the questions the study was commissioned to address: how much water from the Colorado River is available for Colorado to develop, and what are the risks associated with this water? The Phase I results suggests the answer is a large range, from 0 to 800,000 acre feet. We probably knew that the range was 0 to a million acre feet before the study began.

I had hoped that the real value of the study is that it would give a better understanding of the risks. For example, there are three basic drivers of hydrologic uncertainty: obligations at Lee Ferry (75 million/10 vs. 82.5 million/10); hydrologic variability (periodic droughts and wet cycles); and, longer-term climate change risk. The Phase I report did a poor job of describing these factors. The draft report suggests that under current hydrology, (for the report this is 1950

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to present), Colorado has about 200K to 300K acre feet left to develop on the low end and 600K to 700K acre feet left to develop on the high end. The 400K difference is the difference in assumed obligations at Lee Ferry, not hydrology. From a planning perspective, should Colorado assume that it can develop water based on the optimistic assumption that our obligation at Lee Ferry is 75 million acre feet, not 82.5 million? If we're wrong, what are the consequences?

At the last IBCC meeting, Jennifer Gimbel said that the CWCB was working to complete Phase I and had made no decision to proceed with Phase II. Reading between the lines, I see a lot of resistance, based on budget and policy reasons, within the CWCB (and the Front Range) to proceeding with Phase II. Originally, Phase II of CRWAS was to build on Phase I and allow the IBCC/ Roundtables to look at different "what ifs". Additionally, the baseline for Phase I was the current (2009-2010) level of development. There are a number of projects in operation that are currently diverting far less than they will be in the future. Denver's Dillon Reservoir/Roberts Tunnel system is the best example. Another example is the Animas-La Plata Project. Even though Lake Nighthorse is now close to full, for Phase I the project did not exist.

Collectively, I believe that existing projects and projects in the permitting phase, like Windy Gap Firming and the Moffat expansion could divert and consume another 200K and 250K acre feet per year. If Phase II is not going to be completed, the Phase I report should be updated to assume that existing projects are projects that are late in the permitting phase are operated to meet full demands. Without either completing Phase II or updating Phase I, the CRWAS results are going to be incomplete.

## **2. Colorado River Basin Study**

The Bureau of Reclamation (Reclamation), in cooperation with the seven basin states and in consultation with numerous other parties, is preparing a comprehensive study of the Colorado River. The River District has been a participant at the steering committee meetings and we are the contract manager for the Colorado River coalition that has hired Erin Wilson (Leonard Rice Engineering) to help evaluate and prepare comments on the project's many technical reports.

The study is an evaluation and planning tool, not a NEPA document. This gives Reclamation quite a bit of flexibility in how the study is structured and managed. The final report is scheduled to be published in July 2012. During the course of the study, Reclamation will be issuing several interim reports.

The first interim report was issued in early June. Although Interim Report 1 primarily dealt with methodology and technical background information, it made for a good discussion at the CU Natural Resources Law Center (NRLC) conference in early June. The theme was the future of the Colorado River.

Reclamation is addressing hydrology in a manner similar to CRWAS. Model runs will use input hydrology based on the post-1905 natural flow database (reconstructed from the gage record), the paleo record and climate change scenarios. For the climate change hydrology, Reclamation used all 112 GCM options. Interim Report 1 included a detailed appendix covering

hydrology. The mean annual reduction in flow at Lee Ferry under the climate change scenarios is about 8 to 9% by 2050. Although this is significant, it is actually higher than the mean annual flow at Lee Ferry during the 2000 to 2010 period.

For the most part, water demand levels are being provided by individual states. However, for the climate change scenario, Reclamation will adjust existing agricultural demands (crop irrigation requirements or CIR) for temperature increases throughout the basin. In the Upper Basin, CIR will increase by about 5% for each  $F^0$ . In the Lower Basin, the increase is about 3.5 to 4.0% for each  $F^0$ . Reclamation will also adjust CIR for changes in precipitation. However, in most of the basin's crop producing areas, precipitation changes are expected to be small, (and uncertain) whereas temperature changes will be measurable with much more certainty in the science.

The bottom line is that with changes in hydrology, CIR, and increased municipal demands, the basin report is expected to show much stressed hydrology with long periods of shortages and empty or near empty reservoirs. Even under the non-climate change scenarios, there will be significant shortages.

In the next several months, Reclamation will be churning the different hydrologies through its CRSS model and the most interesting part of the study will begin; developing different "solution" alternatives. The posturing has already begun. At the NRLC conference Pat Mulroy gave an excellent speech (as usual). She made the comment that she believes there will be more difficult disputes between users (agriculture vs. municipal) in the future than between basins or among the states. On the same day, the major municipalities that use Colorado River water; Denver, Aurora, Las Vegas, Phoenix, Los Angeles, CAP and MWD, issued a joint press release stating that as major municipal water users they will approach and deal with the basin study in a unified manner. The common denominator for these entities is their relatively junior water rights. I use the term "relative" because Denver's water rights are considered relatively senior (1930s and 1940s), but from a compact perspective, the rights are post-compact. Under very stressed hydrology, Denver could see its Colorado River rights subject to an extended curtailment.

### **3. Curtailment Bank Effort**

This project is moving forward. The grant contract is on the Board agenda for approval. Despite our progress, this project faces some difficult technical and legal issues and political headwinds. We're facing these issues because of the unchartered nature of the effort and because of the broad nature of the coalition participating in the study.

Denver Water (Jim Lochhead) has expressed concerns with where the process is heading. The concerns he's mentioned include the long list of difficult legal issues the legal subcommittee is addressing and whether or not a State of Colorado bank (only) is even a viable solution. We're going to meet with Denver and the State of Colorado before the board meeting. I've attached a list of the legal issues identified to date.

We need to keep in mind that the River District has a set of policy goals with this effort as well; avoiding a curtailment if possible; protecting West Slope agriculture from a “crisis” cause by a curtailment; and protecting our pre-1922 resources. We’ve always believed that a water bank is a solution to “moderately dry” hydrology (a curtailment might occur every 15-20 years). It is not intended to be a permanent source of water for municipalities.

#### **4. Upper Colorado River Commission (UCRC) and Other Activities**

Lisa Wade, who is working for us as a summer intern, is preparing an “educational tradeoff” tool to look at the different options under Articles IV b. and IV c. of the 1948 Upper Colorado River Basin Compact. Under the 1948 Compact, the Commission determines how much each state must curtail to deliver to Lee Ferry. Each state takes over from there.

I’ve written a draft paper titled “Risk Management Strategies for the Upper Basin.” I’ve provided a copy to the Board via a previous email. If you have any further thoughts or suggestions, please let us know.

REK/ldp  
Attachment