Notes from Upper Rio Grande Basin Water Operations Review Interdisciplinary NEPA Team Meeting; March 13, 2003; 1:00 PM; Corps of Engineers Conference Room, Albuquerque

In Attendance:

Jim Bartolino, USGS
Mike Buntjer, USFWS
Deb Callahan, USBR
Art Coykendall, USBR
Tim Darden, NMDA
Ellen Dietrich, SAIC/Corps
Darrell Eidson, Corps
Rhea Graham, ISC
Susan Goodan, SAIC/Corps
Debbie Hathaway, SSPA/ISC
Mark Horner, Corps
Jon Kehmeier, SWCA/NMISC
Bill Leibfried, SWCA/ISC
Dagmar Llewellyn, SSPA/NMISC
Clay Mathers, Corps
Claudia Oakes, SWCA/NMISC
Brian Ortiz, USFWS
Chris Perez, USFWS
Nancy Purdy, USBR
Gail Stockton, Corps
Jack Veenhuis, USGS
Scott Waltemeyer, USGS
Doug Wolf, Tetra Tech/Corps

- Rhea Graham opened the meeting. After self-introductions, she introduced James Bartolino from USGS. Rhea commented that USGS has now made reports for public audiences that are less technical and more easily understood.
- James Bartolino gave a slide presentation summarizing the current understanding of groundwater resources in the middle valley, based on a six-year study between 1995 and 2001. The information he discussed is summarized below, followed by questions from the group.
  - The information is summarized in USGS Fact Sheet 088-02, September 2002, and in "Ground-Water Resources of the Middle Rio Grande Basin, New Mexico", Circular 1222. Both were available at the meeting. Many other specific technical reports have been generated from this study also.
  - The reports address the hydrology, geology, and land surface characteristics of the middle Rio Grande groundwater basin from Cochiti to San Acacia.
  - James presented information on the surface water system tributaries, inflow/outflow, management controls, vegetation, and withdrawals. He noted that 94 percent of surface water withdrawals are for agriculture and livestock.
  - The groundwater system is the unconfined Santa Fe Group aquifer with a thickness ranging from 1,400 to 14,000 feet. Groundwater is used by agriculture and livestock (37%), public water supply (56%), and commercial/industrial (3%), with an unknown quantity used by private wells.
  - Groundwater chemistry was determined by sampling 288 wells and springs. Thirteen hydro-chemical zones were identified in the aquifer to infer water sources, direction of flow, and recharge conditions. No clear trends were identified related to pumping by the City of Albuquerque.

- Groundwater declines from pre-development conditions of greater than 160 feet have been identified in northeast Albuquerque. These declines can cause decreased water quality, increased costs of pumping, and eventual depletion.
- The researchers used remote sensing to monitor possible subsidence or compression. Surface movement is occurring along fault lines in some locations. Organic soils in the North Valley near 12th and Candelaria have become dewatered and are compressing, causing some surface movement.
- Conclusions from the groundwater flow model include the following:
  - The connection between the river and the aquifer is less than previously thought.
  - There is a smaller high quality aquifer than previously thought to exist.
  - Geologic faults in the system are more numerous and hydrologically more significant than previously thought.
  - Mountain-front recharge of the aquifer is less than previously thought.
  - The present bosque is only 60 to 70 years old and causes significant water loss.
- Future similar studies planned by USGS will evaluate the East Mountains, Española Basin, and others.
- **Question:** How are the faults significant?
  - **Answer:** Previous information described the aquifer as an alluvial system in which faults were unimportant. This study determined that there are underlying faults that affect groundwater flows. In some areas there are permeable bedrock units that may drop and block flows or strike/slip faults may cause cementation that blocks flows.
- **Question:** Canal seepage problems were identified in the water budget. Why?
  - **Answer:** The model used a ½-kilometer grid cell size that did not allow for the river and the riverside drain to be segregated in the analysis. At a smaller grid cell size, the determination of canal seepage may be better defined.
- **Question:** Before the bosque, what was there?
  - **Answer:** Scattered stands of cottonwood and, after 1900, tamarisk and other exotics. The river was wider then. Levees and dams now stop overbank flooding.
- **Question:** What is the likelihood of sinkholes forming?
  - **Answer:** Sinkholes are created where there is limestone bedrock, not in the Rio Grande valley where subsidence occurs slowly in large areas (several acres). Subsidence is caused by depletion of the aquifer where water is no longer supporting the land surface.

- Darrell Eidson presented two draft work plans for the River Geomorphology, Sedimentation, and Mechanics Technical Team to carry out analysis in support of the technical teams. The purpose of the plans and the meeting discussion are summarized below.
  - Sediment continuity and discharge analysis of the middle Rio Grande valley would be used to assess how the channel handles predicted flows.
    - The team would use the hydrographs from URGWOM, and the velocities and shear stress from FLO-2D, to generate sediment transport rating curves to predict sediment volume transport for the entire reach.
    - The team could then compare predicted discharge and sediment transport to baseline conditions to determine trends in channel morphology.

- **Question:** Will sediment transport be fed back into FLO-2D?
  - **Answer:** FLO-2D is currently a fixed-bed model. It may be possibly to take data from FLO-2D by reach, generate predictions from the Geomorphology Technical Team methodology, then input back into FLO-2D.
- Output from this analysis would include channel width vs. depth and aggradation/degradation by reach over time. Different channel releases could be distinguished and results would be summarized over the 40-year period with statistics for each reach.

➢ Bank erosion analysis would be used to develop an index to facilitate comparison of the tendency of streambanks to erode under different alternatives.

- Sites to be surveyed will be selected in coordination with the technical teams. Sites may be selected by considering only the locations where channel changes are likely to occur, especially below Abiquiu, below Cochiti, and in the middle valley.
- Analysis will consider the hydraulic energy, shear stress, and velocities from FLO-2D, as well as channel morphology and indices projected for conditions under each alternative to predict whether the streambank would be likely to erode, compared to baseline conditions.
- The channel to be evaluated to identify streambank erosion is defined as the non-vegetated channel.
- **Question:** Will the team integrate vegetation data into the analysis of bank erosion?
  - **Answer:** When the team conducts some site surveys to assess bank characteristics, the members would document vegetation also. The vegetation mapping in GIS may help the team to screen out some areas to eliminate from site surveys because there may be a correlation between some vegetation types and lateral bank erosion.
- **Question:** Can the technical team provide any site-specific guidance for the Cultural Resources Technical Team to help determine whether a location of archaeological importance would be likely to erode, possibly through knowledge of the characteristics of the reach?
  - **Answer:** Technical teams could recommend specific areas for field surveys and these locations could be used to compile the index for the reach.
- There was some discussion of whether the technical teams need to have the analysis of bank erosion completed or whether information on aggradation/degradation would be more important.
  - It was agreed that the aggradation/degradation information and trends would be needed for all reaches and all alternatives.
  - The type and extent of bank erosion at specific locations could be provided to teams if specific concerns are identified first. Cultural Resources and Riparian and Wetlands Technical Teams may have the most need for the location of bank erosion under some alternatives. Bank erosion would not be characterized by reach for all alternatives, however.

- Mark Yuska updated the group on the status of the URGWOM Planning Model.
  - Most of the problems with the operational ruleset have been fixed. Testing is progressing. The operations rules for the daily Water Operations Model are the same as those to be used in the Planning Model, so once the operations rules are completely running, the Planning Model will operate.
  - Mark showed a slide presentation that illustrated the output from a 3-year URGWOM run of dry and average flow years.
  - **Question:** Are the numbers the model is generating with the new ruleset making sense to facility operators?
    - **Answer:** Yes, they have been reviewing the output and it does make sense. The runs that were shown in the slide presentation were done to check the functioning of the model, not to predict flows.
  - The Rio Grande Compact Commission's Engineer-Advisors have approved the simplified model outflows from Elephant Butte that have been proposed for use by URGWOM.
  - The group discussed the possibility of selecting certain flows that may be used under one of the action alternatives to run through FLO-2D. URGWOM would provide the frequency of selected flood flows and the Geomorphology Technical Team would generate flow duration curves. Doug Wolf would then select some of the flows to run through FLO-2D. This exercise would help to determine how well the proposed interaction between these models will work before the main analysis is underway.
- Gail Stockton and Rhea Graham updated the group on development of the operational alternatives. The current version was distributed at the meeting and is posted on Team Link.
  - **The facilities listed in the alternatives table are in order from upstream to downstream. When writing sections of the EIS, technical teams should discuss the operations and impacts in the same order.**
  - If any technical team has questions about the alternatives, they should be directed to the URGWOM Integration/Water Operations Technical Team.
  - **Question:** Does the amount of Abiquiu storage listed in the table refer to native storage?
    - **Answer:** Yes, assume that the City of Albuquerque drinking water plan is functioning as proposed.
  - **Question:** Why does the type of year (dry, average, wet) dictate the amount of storage?
    - **Answer:** The operational alternatives in their current form reflect hydrologic reality and include the most likely operations for that hydrograph. After the full 40-year sequence has been run through the Planning Model for each proposed alternative, it is expected that the variability in storage and flows will be more clearly defined.
  - **Question:** Why are there no other capacities listed for Abiquiu storage other than 0 or 180,000 acre-feet?
    - **Answer:** This is to be used as the starting point. Once they are run through the Planning Model, they could be rerun with different maximum storage levels and necessary changes to the description of the alternatives can be incorporated
  - URGWOM Planning Model runs may be available for the next Interdisciplinary NEPA Team meeting in April. **The next meeting agenda will include time for a discussion of the parameters listed in the alternatives, if model runs can be reviewed and summarized in**

advance. The purpose of this discussion is to ensure that there are no technical team concerns with the alternatives to be evaluated. The Project Managers may consider making the April meeting a workshop to include more technical team members.

- Bill Leibfried announced that the Aquatic Systems Technical Team received a **draft report of the pilot aquatic habitat model for the Bernardo site. At their next meeting on April 8 at 1:00 p.m. in Room 119 at the Corps, there will be a presentation of this study. All technical team members are invited to attend.**
- **Technical teams should edit their text for Chapter 3 (Affected Environment) to enable their sections to be a few pages each.** The Project Managers are striving to make the entire EIS, without technical reports or appendices, around 100 pages. **The Project Managers will develop a template to guide the editing.**
- **The next meeting of the URGWOPS ID NEPA Team will be held at the Corps on April 10 at 1:00 p.m.**