

July 26, 2001

**San Juan River Basin
Recovery Implementation Program
Hydrology Committee**

**June 1, 2001
Conference Call Summary**

Members Present:

Errol Jensen, Chairman

Ron Bliesner

Ray Alvarado

John Whipple

Bill Miller

Dave Frick

Randy Kirkpatrick

Representing:

U.S. Bureau of Reclamation

Bureau of Indian Affairs

State of Colorado

State of New Mexico

Southern Ute Indian Tribe

Jicarilla Apache Nation

Water Development Interests

Others present:

Dave King

Brent Uilenberg

John Simons

Tom Pitts (for Steve Harris)

Shirley Mondy, Program Coordinator

Nancy LaMascus

Representing:

U. S. Bureau of Reclamation

U. S. Bureau of Reclamation

U.S. Bureau of Reclamation

Water Development Interests

U.S. Fish and Wildlife Service

City of Farmington

Review of Agenda (Attachment 1): Errol Jensen, Chairman, reviewed the agenda. A discussion on new model runs for the Navajo EIS and an update on the Navajo Gallup modeling were added to the agenda.

Review of summary from May 1, 2001 Conference Call: There were differing views on how to improve the language on the San Juan - Chama shortages discussion. It was decided that language would be added to the paragraph to state “The Committee discussed shortages and the manner in which they may affect water supply. It is beyond the purview of the committee to determine shortage criteria.” The meeting summary was accepted with this language inserted into the paragraph.

Low Flow Test: The low flow test is still scheduled to take place in July. There was a question about how many people are going to be out in the river doing gaging. The Bureau of Reclamation (Reclamation) clarified that there are going to be several groups gaging the river. There have been indications that the users of Citizens Ditch will not let anyone on their ditch to measure water being diverted. The State of New Mexico has been asked to measure diversions since they are the only ones in the Program that have the authority to do so. John Whipple indicated that the State has not agreed to step in yet, and it does not look like the Aztec office is ready to go to verify authorized users. Reclamation will have to measure upstream and downstream of that diversion to determine what they are taking.

Action Items from May 1 Conference Call:

1. **Reclamation and Keller-Bliesner will complete incorporation of comments on the model documentation** – This has not been completed yet.
2. *Errol Jensen is still waiting for the final Hydrology Committee proposal.*
3. *Reclamation will write a letter to the water districts* – this has not been done yet.
4. Reclamation will develop a Draft FY 2002 budget – completed.
5. *Errol will draft a Progress Report using Dave King’s information* – Not completed yet.
6. Log modifications - complete, waiting for permanent website to put the information.
7. Dave King will send a note to the Committee on how we are dealing with Heron Reservoir in the model – Through the documentation and the operating criteria on the website, this item has been completed. *Model runs currently on the Keller-Bliesner website should be placed on the permanent model website as soon as it is available. Ron Bliesner will get the data to Dave to add to the website.*
8. *For minor modifications, Keller-Bliesner and Reclamation will brief the Committee* - this is ongoing. There were no new issues.
9. *John Simons will give Dave King and Ron Bliesner the allocations from the meeting with New Mexico.* This has not done yet. John gave Dave some information, but needs to get with John Whipple.

10. Errol Jensen will review the Work Plan and determine how much can really be obligated by the end of fiscal year 2001 – Errol is still working on this item. He is working with the contract folks in Salt Lake City. The Western Area Power Administration would like to know what funds aren't going to be expended in 2001. ***Within the next three weeks, Errol will let Brent Uilenberg know what funds won't be used this fiscal year.***
11. Errol Jensen will draft the budget for FY 2002 – Completed. (It was decided that we need more detailed description and a determination of who's going to do what.) There was a question on why the costs increased from \$400,000 to \$455,000? Dave King adjusted several time frames and associated work days to be more realistic. In addition, there was approximately \$15,000 for CADWES that wasn't anticipated. The Committee is going to try to have it ready by the Coordination Committee meeting. Errol will send the revised version to the listserver. The scope of work hasn't really changed, just adding detail.
12. ***Colorado and Keller-Bliesner will provide information to Errol for the Progress Reports*** -- Colorado is in the process of updating irrigation acreages which will be complete by the end of the calendar year, if not earlier.
13. Shirley Mondy will follow up with Jim Brooks on what is happening on the task force for the Long Range Plan - Shirley talked with Jim Brooks. That subgroup still hasn't met. It is up to Jim to get the group together.

Progress Report on Work Completed since May 1 Conference Call (Attachments 2 & 3): Dave King spent a couple of weeks developing a website to house the model documentation and other model information. He met with Colorado staff to verify water rights. They have started with the data transfer between the two applications, but have not gotten as far as they wanted. The newer version of RiverWare handles lagging much better.

There were questions about how the water rights algorithms in RiverWare were handled. Dave King said that it is not like Colorado, but they are trying to do it as much like Colorado's as possible. The model will probably do it using sub-basins. There were several questions from New Mexico and Colorado on how water rights will be used in the model. ***The Hydrology Committee would like to see the proposal on handling water rights before it is implemented.***

John Whipple had a question on the progress report that was sent out. New Mexico would like the methodology and information that was provided to Colorado regarding GIS (Item 4 on Oct - April progress report). ***John Simons and Dave King will work with John Whipple to get the information transferred to John Whipple.***

Data Needs to Complete Modeling Work - Dave King is not waiting for anything in particular right now. Once they get the New Mexico configuration figured out, they will use the old data to start looking at the model. Colorado has scheduled their work to move their information and model through 1999. They would have to work with John Whipple to extend New Mexico's data as well. Colorado can generate the natural flows, but will have to redo them once they get the data from New Mexico.

Additional Runs to Be Done for the Navajo EIS: Currently, all of the model runs are posted on the Keller-Bliesner site, including the runs for the 250/400 EIS alternative. Reclamation will be doing some more runs on the variable alternative. Ron Bliesner offered assistance to optimize the runs.

Schedule: (Dave King) Reconfiguration of the model is on a critical path. If we get that out of the way, then we can go down parallel paths with Colorado. John Simons is crunching numbers that New Mexico gave him and will break them down by nodes (about every diversion structure on the mainstem San Juan) and return flows. The time line indicates that the 1929 data will be finished by September 1 that we will move ahead to 1999 data by September 15.

2002 Work Plan (Attachment 4): Draft Proposal needs more detail. Errol Jensen will try to have it out by next week to the Hydrology Committee so that it can be finalized by June 15.

Navajo - Gallup Project: The Bureau of Indian Affairs (BIA) initiated informal consultation with the Fish and Wildlife Service. BIA haven't figured out the modeling yet. There cannot be any new depletion in the basin, so the Navajo Nation is looking at their water supply to see how they can guarantee this project. They are looking at ways to not have to do reasonable and prudent alternatives and are looking at meeting the flow recommendations without new depletions. The time frame for completing consultation is that the draft/final BA is anticipated in the fall, and the final in early 2002, depending on funding. The Jicarilla Apache Nation is actively pursuing participation in the project to use the eastern portion of the planned facilities to take up to 1,200 acre feet of their San Juan basin water rights to serve the southwest portion of the reservation.

Misc.: *Errol will give copies of all handouts to Tom Pitts (progress reports, budget, website).*

Next meeting- July 25 in Farmington (9 am - 3 pm).

Attachment 1

**San Juan River Basin Recovery Implementation Program
Hydrology Committee Conference Call
June 1, 2001**

Agenda

1. Introductions and review of agenda items
2. Review of notes from May 1, 2001 conference call
3. Low flow test
4. Action items from May 1, 2001 conference call
5. Progress report on work completed since May 1, 2001 conference call
6. Data needs to complete modeling work - any new information
7. Discussion on 2002 Hydrology Proposal
8. Other

San Juan Recovery Implementation Program
Hydrology Model and Studies
October, 2000 through April, 2001 Activities
4/27/2001

1. Previous generation of RiverWare model rules were migrated to run entirely in “new” rules environment. Previous generation of rules was a bridge between “new” and “tcl” (old) rules system. Although actual rules in new model may vary considerably from the previous generation, individual functions may still be used in the new model. Completion of this task enables us to eliminate most compatibility issues between model generations. This task was completed before SJRIP funds became available using other sources of funding.
2. All comments from previous generation of model were incorporated to the extent possible. It was important to complete this documentation before the modelers became too involved in the new model development. This task was mostly completed without SJRIP funds.
3. Two sensitivity runs were made with the previous generation of model to better understand how the system responds. These runs have not been analyzed (post processed) but could provide some information to improve the next generation model.
3. A contract has been arranged for analyzing and correcting gage errors.
4. Reclamation GIS sets have been updated with Colorado, New Mexico, and USGS coverages. In addition, research funds were used to develop a methodology to estimate the portion of return flows that return to subbasins generated using GIS technology. Return flow proportions are important when estimating water supply of individual water users in StateMod. Some programs funds were used to apply this technology to the San Juan basin. The technology has been provided to Colorado Water Conservation Board to use as they see fit to improve the SJRIP StateMod model.
5. Reclamation have acquired all necessary CDSS (Colorado Decision Support System) software, existing San Juan StateMod model, support data, and documentation. Reclamation staff have worked with CWCB to clarify StateMod methods, data, and operating criteria.
6. DMI's (Data Management Interfaces) have been developed to move data between StateMod and RiverWare, between StateMod and two common Reclamation data formats, and between StateMod and HDB (Hydrologic Data Base). A prototype HDB has been installed in Denver.
7. StateMod return flow methods have been created in RiverWare using research funds. The methods have been tested but additional modifications needs to be completed before the return flow methods can be seen by rules when lagging is invoked.
8. Mapping of CDSS nodes to RiverWare nodes is nearly complete. A validation model will be built initially to verify that water moves through the RiverWare model as it does in StateMod. This model should be completed and tested by mid May.

San Juan Recovery Implementation Program
Hydrology Model and Studies
May, 2001 Activities
5/31/2001

1. Developed log of first and second generation models and rulesets and created web access of same. Included in this structure are a model and ruleset naming convention, links to models and rulesets, links to scenario model runs, and links to documentation.
2. Created a Hydrologic Database (HDB) in Denver to support data access of model input and output data.
3. Met with CADSWES to discuss modifications to HDB to support depletions datatypes. The modifications are minor and non program funded.
4. Met with Ray Bennet of CWCB to clarify how CDSS StateMod water right's algorithm works and to discuss StateMod implementation of the variable efficiency method.
5. Made initial San Juan main stem reconfiguration after discussions with NMISC. Additional discussions with NMISC to clarify some items.
6. Completed software to support mapping of RiverWare nodes to CDSS and DMI's.
7. Built validation model of Piedra basin. Still need to populate and test.
8. Obtained and tested a newer version of RiverWare that corrected a problem with initial conditions for multiple lagged return flows. This version of RiverWare also has a new rules function that should help in SJRIP. It does not yet have the ability to see lagged return flows when estimating reservoir releases. That modification should be available by June 22.

Draft- For Discussion Purposes Only
5/31/2001

Hydrology Committee FY 2002 Work Plan
San Juan RIP Naturalized Flows
Recommendations For Addressing Problems

Background

During September 2000, Hydrology Committee FY 2001 Proposal No. 1 (FY 2001 Proposal) (see attached) was submitted to the Coordination Committee. This proposal outlined a process to reconfigure the Hydrology model that was used to evaluate operating scenarios to determine if they meet the flow recommendations and to check, improve and/or replace data that were being used in the model. Small improvements were being made as the model was being used. However, because of several problems that existed with the model and the data used in the model, it was felt by the Hydrology Committee that a major overhaul was needed.

The FY 2002 Proposal contains the history of the development of the model. The Coordination Committee agreed with the proposal and approved that \$400,000 of the San Juan River Basin Recovery Implementation Program funds could be used to work on the model. Work on the model was scheduled to start as soon as funding was approved. However, because of not knowing if funds were going to be available (problems at Western Area Power Administration), work on the model using program funds did not commence until March 2001. Some work was initiated using other funding sources.

Work is proceeding on overhaul of the model and on updating and correcting the data. However, because of the startup problems mentioned above, not all of the \$400,000 will be spent in FY 2001 and funds will be needed in FY 2002 to complete the work on the model. In addition, estimated cost has increased to \$455,000. Work will continue as outlined in the FY 2001 Proposal; however, on a longer time schedule. Table 1 shows an estimate of what will be completed in FY2001 and what work will be completed in FY2002.

Area of study

The Area of study/hydrology modeling area includes the whole San Juan River Basin.

Objectives

The objectives of the modeling work remains the same as proposed in the FY 2001 Proposal and include improve confidence in the model through improved data consistency, better modeling methods, better coordination and input with stakeholders, and improved model documentation.

Method of Approach

In the process of completing the FY 2001 work, several tasks outlined in the FY2001 proposal were combined with other tasks or the tasks have been divided into sub tasks. This was done to help the Hydrology Committee better understand the work that being done. Table 2 is a more detailed work plan. The tasks in Table 2 correspond to the original work plan tasks of Table 1.

Table 1. FY2001 Proposal estimated schedule, labor requirement and cost, estimated tasks completed and funds expended in FY2001 and schedule and proposed funding for FY 2002.

Task	FY 2001 Proposal	Professional time - staff days			Estimated Cost	FY 2001 Funds	FY 2002 Funds	Target Schedule
	Schedule	USBR	Consultant	Total				
A. Analyze and correct gage errors.	Nov-00	0	20	20	\$14,000	\$14,000		Jun-01
B. CDSS interface	Nov-00	51	7.5	58.5	\$39,100	\$25,900		Jun-01
C. Data systems development	Jan-01	51	7.5	58.5	\$39,100	\$54,500		Jun-01
D. Correct 1970 -1993 database	Mar-01	13	5	18	\$12,100	\$10,000		Aug-01
E. Extend data sets to 1929	Apr-01	13	5	18	\$12,100	\$10,000		Sep-01
F. Extend data sets from 1993 to 1999	May-01	13	5	18	\$12,100	\$10,000		Sep-01
G. Configure and Calibrate CDSS	Jun-01	74	10	84	\$54,160	\$14,600	\$39,560	Dec-01
H. Implement functionality in Riverware	Jun-01	16	0	16	\$11,200	\$9,520	\$1,680	Dec-01
I. Daily disaggregation	Aug-01	30	65	95	\$64,030	\$31,000	\$33,030	Jan-02
J. San Juan Model upgrade / calibration	Sep-01	76	53	129	\$86,330	\$4,200	\$82,130	Apr-02
K. Coordination with stakeholders	Through-out	10	10	20	\$13,500	\$7,000	\$6,500	Apr-02
L. Develop complete documentation	Nov-01	46	30	76	\$50,312	\$14,900	\$35,412	Jun-02
				Expenses	\$46,500	\$31,380	\$15,120	
				Total	\$454,532	\$237,000	\$217,532	

Table 2. SJRIP Proposal 1 - Schedule, Costs, and Accomplishments

Task	Item	Actual Completion	Target Schedule	Percent Completion	Program Budget	Expenditures	Description
N/A	1	01/15/01	01/15/01	100.00%	\$0		Migrate flushing release computations to RiverWare rules language.
L	2		05/01/01	95.00%	\$3,312		Complete doum entation of previous SJRIP Hydrology Model.
A	3		06/01/01	10.00%	\$14,000		Analyze gage errors and correct gage record as required for reasonable water balance.
B/C	4		03/01/02	95.00%	\$18,500		Evolve GIS coverages and databases to support CDSS. Cross check CDSS return flow apportions and extend into New Mexico, Arizona, and Utah.
B/C	5		05/01/01	95.00%	\$10,500		Review CDSS San Juan StateMod model and databases, engineering methods, water rights algorithm, and documentation. Identify RiverWare modifications to reproduce CDSS return flow methods and decision process.
J	6		01/00/00	75.00%	\$4,200		Sensitivity testing of previous model to improve knowledge of system.
B/H	7		04/01/01	80.00%	\$4,200		Develop and test implementation of StateMod return flow procedures in revised RiverWare.
H	8		05/01/01	15.00%	\$7,000		Develop and test StateMod water rights procedures in revised RiverWare.
B/C	9		06/01/01	20.00%	\$20,500		Develop data sets equivalent to CDSS data in RiverWare tems. This will consist of expressing CDSS diversions and efficiencies as depletion rates and acreage, and transforming CDSS total naturalized flows into discrete (gains) flows. The first task is a spreadsheet exercise. The second tasks could be done with a RiverWare model.
B/C	10		06/15/01	10.00%	\$6,800		Identify and quantify incidental losses that will be used for newer projects by StateMod and RiverWare.
B/C	11		05/15/01	60.00%	\$21,900		Develop data storage, analysis and retrieval system, including Data Management Interfaces (DMI's) between respective applications and databases.
D	12		08/01/01	20.00%	\$12,100		Correct 1970-1993 database to address known deficiencies and concerns, especially New Mexico's.
E	13		09/01/01	40.00%	\$12,100		Extend data sets backward to WY1929.
F	14		09/15/01	10.00%	\$12,100		Extend data sets forward through WY1999.
G	15		10/01/01	0.00%	\$0		Reconfigure CDSS StateMod consistent with revised data sets and recompute naturalized flows for the period of available data.
G	16		07/01/01	10.00%	\$2,600		Identify and develop procedure to compute shortages of ungaged diversions in New Mexico.
G/H	17		11/01/01	10.00%	\$24,060		Build and test RiverWare validation model reconfigured as per revised StateMod model.
G/H	18		12/01/01	0.00%	\$27,500		Build and test reconfigured RiverWare calibration model.
I/J	19		01/15/02	0.00%	\$29,530		Formulate and test revised decision model operating criteria including sensitivity testing of identified alternatives for improved performance.
I	20		10/01/01	0.00%	\$34,500		Disaggregate monthly naturalized flows, diversions and depletions into pseudo daily values.
J	21		02/15/02	0.00%	\$42,030		Build and test revised (reconfigured) SJRIP Hydrology Model (decision model).
J	22		04/01/02	0.00%	\$40,100		Analyze runs of revised SJRIP Hydrology Model.
K	23		04/01/02	10.00%	\$13,500		Coordinate development with Hydrology Committee and interested parties.
L	24		06/01/02	0.00%	\$47,000		Develop documentation
Expenses					\$46,500		Balance
Total	All		03/01/02	16.71%	\$454,532	\$75,975	\$378,557
				FY2001	\$237,000	\$75,975	\$161,025
				FY2002	\$217,532	\$0	\$217,532
Expenditures are through ----->				05/18/01			NOTE - Cost includes \$15,000 for RiverWare modifications.