FY 2020 Project Proposal
San Juan River Basin Hydrology Model
Operation and Maintenance

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Relationship to SJRIP: Supports Program goals and management by developing, operating and maintaining a hydrology model of the San Juan Basin. The model is key to hydrological analysis of water development scenarios or other scenarios in relation to the flow recommendations.

Background:
The San Juan Basin Hydrology Model (SJBHM) is a hydrologic model of the San Juan River Basin. The SJBHM actually consists of a series of models including evapotranspiration models, a natural flow model in StateMod, and a simulation model in Riverware. Revisions and modifications to the models and supporting data have occurred through a multi-year model development and validation phase. The FY2020 scope of work includes updates to data as available, annual operation and maintenance of the model and data management. FY2020 activities will also include continued streamlining of model processes as new Riverware updates and methods allow, and incorporation of extensive comments as appropriate from the validation process for Gen 4. The Bureau of Reclamation has the primary responsibility for model development and O&M.

Once approved, the model will be available to generate and analyze runs associated with Section 7 Consultations and/or special requests from the Biology or Coordination Committees related to the flow recommendations or other hydrological aspects of the Program.

Objective:
The objective for this work is to ensure that the San Juan Basin Hydrology Model is available for run requests. This will be accomplished by adjusting model configurations or operating rules to incorporate new data and/or scenarios when requested, and evolving the data set forward through time. The FY2020 request also includes funds to continue coordination and interaction with the Program participants and their technical designees.

Deliverables:
An annual hydrology meeting detailing the accomplishments of the model development, data development and model runs will be held for program participants by August 31st. A review and comment deliverable will be sent out within one week of the Annual Hydrology Meeting, with a final report provided to the coordination committee within one month of the meeting. In addition, data, documentation and reports from model runs will be provided throughout the model run process. Any model runs requested by the SJRIP will be accompanied by a report within one month of the run completion. The modified model(s) and supporting data and scripts will also be delivered / made available. Climate change modeling and analyses will be completed by the end of FY2020, and a special presentation or report on the climate change runs and analyses will be

provided. The latest version of the models and live documentation will be provided at the end of every fiscal year.

Task Descriptions:

Task 1: Model Modifications In collaboration with the SJRIP Program Office, implement and document any changes made to the model operations.

Task 2: Model Maintenance Includes maintenance of the actual model as well as the supporting data and software. Maintain data to evolve the data set forward through time. This includes an annual update (when available) of USGS data, Reclamation data, New Mexico non-irrigation data, New Mexico irrigation data, Arizona and Utah depletions, Colorado depletions, climate data, and natural flow data. Data must be obtained from various sources and processed for compatibility with the multiple data loaders. Load updated data into the model, run and test the new data. Adjust model configuration, methodologies, or assumptions, as needed. New Riverware updates and versions include streamlined methods that will be adopted when appropriate. Update and expand documentation to reflect current state of model. Update and maintain data management interfaces and other software associated with the data and models. Apply all Riverware updates and patches as they become available. Provide technology transference to Reclamation's Western Colorado Area Office and Fish and Wildlife Service staff in the details of maintaining the data and models. Technology transfer will continue as model, data and software updates take place to ensure that several people are trained in the maintenance of the model.

Task 3: Model Runs and Analyses Generate and analyze model runs associated with the implementation of a revised hydrologic baseline, revised flow recommendation scenarios, Section 7 consultations or special requests from the Biology and/or Coordination Committees and/or special work groups. A consultation or scenario run usually requires model reconfiguration and the implementation of operating criteria. Provide modeling runs and analysis associated with the maintenance release concept and its potential incorporation into the decision tree. Provide ongoing modeling support in the collaborative effort between Reclamation and Sandia National Laboratory to complete climate change modeling runs and analyses. Provide technology transference to Reclamation's Western Colorado Area Office and Fish and Wildlife Service staff in the details of maintaining the data and models, and in operating the models. Technology transfer will continue as model runs and analyses are being executed to ensure that several people are trained in the operation of the model. Provide updates to appropriate documentation appendices as new model runs are completed, and update main documentation text with the incorporation of the maintenance release if recommended by the Program.

Task 4: Program Management and Coordination Attend or provide written reports for Coordination Committee meetings, as needed, to update the committee on the model status and model results. Attend and assist in conducting Hydrologic Baseline Workgroup meetings to provide model status updates, present results, and work on developing the revised hydrologic baseline. Conduct an annual hydrology meeting of Program participants to review and solicit input on accomplishments and activities relating to the model for the previous year, status of the model, and proposed activities for the coming year; and provide a report on the meeting to the Coordination Committee for their review and approval. Develop the FY2020 budget and track FY2019 expenditures.

Budget Summary FY 2020

Model Modifications	$18,000
Model Maintenance	$18,400
Model Runs	$12,000
Program Management	$22,000
Grand Total	**$70,400**

FY-2020	**$72,500**	†
FY-2021	**$74,700**	†
FY-2022	**$76,900**	†

† Assumes ongoing model maintenance, model runs, tech transfer, documentation updates and program management and includes ~3% adjustment.

Task 1 Model Development

A) Labor

	Task	Salary total/hr	Total Days	Total cost
1	Model changes or updates	$100	10	$8,000
2	Continued Tech Transfer	$100	5	$4,000

B) Travel

	Purpose	Dest.	Trips	Days/ Trip	Airfare/ Trip	Lodging, expenses/day	Total Cost
1	Reclamation meeting with SJRIP	ABQ	1	2	$500	$250	$1,000

C) Other Costs

	Task	Total Cost
1	Riverware Technical Support	$5,000
	Task 1 Total	*$18,000*

Task 2 Model Maintenance

A) Labor

	Task	Salary total/hr	Total Days	Total cost
1	Data Updates as Available	$100	10	$8,000
2	Software Updates	$100	3	$2,400
3	Methodology updates as needed	$100	10	$8,000
	Task 2 Total			*$18,400*

Task 3 Model Runs

A) Labor

	Task	Salary total/hr	Total Days	Total cost
1	Model Runs and Analyses	$100	15	$12,000
	Task 3 Total			*$12,000*

Task 4 Program Management Coordination

A) Labor

	Task	Salary total/hr	Total Days	Total cost
1	Meetings and Coordination	$100	20	$16,000
2	Budget	$100	5	$4,000

B) Travel

	Purpose	Dest.	Trips	Days/ Trip	Airfare/ Trip	Lodging, expenses/day	Total Cost
1	Reclamation to Workgroup Meetings	ABQ	2	2	$500	$250	$2,000
						Task 4 Total	*$22,000*

TOTAL	**$70,400**