Appendix I SJRIP RIVERWARE MODEL USER'S GUIDE

This user's manual for the SJRIP RiverWare model presents basic information related to importing and exporting data, configuring various scenarios for model runs, and verifying the calibration of results.

SJRIP RiverWare Model Data Management Interfaces (DMIs)

The SJRIP RiverWare model uses the following DMIs to move data into and out of the model. All data is set to data objects and initialization rules are used to set the appropriate data to the simulation objects at the beginning of model runs. Input DMIs do not need to be run each time as the data imported is saved within the model. They only need to be run when the data is updated or otherwise changed.

- Input DMIs
    - DailyFilledHistoricFlows – This DMI imports the daily filled USGS streamflows and some other daily data series into the model.
    - ETACMonthlyCIR – This DMI imports the monthly CIR rates for the NM agricultural water users into the model.
    - LocalInflowsFromHistoricModel – This DMI imports the daily local inflows, calculated by the SJRIP RiverWare Historic model, into the model.
    - StateModMonthlyBaselineInputs – This DMI imports the StateMod monthly baseline inputs, from StateMod run output, into the model.
- Output DMIs
    - OutputAnnualDepletionsAndDiversions – This DMI outputs the model result depletions to the SJBHM Depletion Report workbook.

"Run Setup Data" Data Object Controls

These slots on the "Run Setup Data" data object control the configuration and scenario of the run:

- ***SJRIP Restoration Release Type*** – This scalar slot controls the type of SJRIP restoration releases that the run uses. A value of 0 uses "Run C" SJRIP releases. A value of 1 uses the "Old Flow Recs" SJRIP releases. Note that the selection here must also correspond with the appropriate rule configuration, as described below.
- ***SJBHM Demand Scenario –*** This scalar slot controls the SJBHM demand scenario that the model run uses. A value of 0 uses the SJBHM Baseline demand scenario. A value of 1 uses the SJBHM Current Conditions demand scenario.
- ***NIIP and NGWSP Scenario –*** This scalar slot controls the NIIP and NGWSP scenario during SJBHM Baseline runs. A value of 0 uses the "NIIP with Navajo Depletion Guarantee reductions and NGWSP" demands. A value of 1 uses the "Full NIIP and No NGWSP" demands. This slot only applies when the SJBHM Baseline demand scenario is selected.
- NIIP Depletion Demand Target Levels – This table slot is used to hold the various NIIP target depletion levels associated with the demand scenarios.

Changing between "Run C" and "Old Flow Recs" SJRIP Releases

To Run with “Run C” SJRIP Releases:

- Turn On – Policy Group “Available Water Calculation Rules”.
- Turn On – Policy Group “RUN C - 2016 Flow Recommendation Analysis Rules - REMEMBER TO SET EOWYST SLOT TO 6050”.
- Set scalar slot “NewFlowRecs.EOWYST Elevation” to 6050 ft.
- Turn Off – Policy Groups “RUN A…” and “RUN B…”
- Turn Off – Policy Groups “1996 BO Flow Recommendations Operations”

To Run with “Old Flow Recs” SJRIP Releases:

- Turn Off – Policy Group “Available Water Calculation Rules”.
- Turn Off – Policy Group “RUN C - 2016 Flow Recommendation Analysis Rules - REMEMBER TO SET EOWYST SLOT TO 6050”.
- Turn Off – Policy Groups “RUN A…” and “RUN B…”
- Turn On – Policy Groups “1996 BO Flow Recommendations Operations”

Shortage Sharing Calibration Verification

The current model process that calculates and sets the shortage sharing percentage in simulated years with shortages, which happens in Run Cycle 4, is not perfect. Thus, after each model run it must be verified that the applied shortage percentage was successful in eliminating the shortage condition in that year. A correct shortage percentage will result in the Navajo Reservoir pool elevation/storage conditions coming out of the storage year (and continuing forward in time) will match the Run Cycle 3 solution as identically as possible. Verification of this is currently accomplished manually by reviewing the “Navajo Pool Elevation After Shortage Sharing” output device plot and/or the result data itself. Select model results after each Run Cycle are saved in the “NewDailyOutput” data object for comparison to results from other Run Cycles.

NIIP Groundwater Calibration Verification

The SJBHM Baseline depletion scenario assumes that NIIP groundwater interaction has achieved an approximate long-term dynamic equilibrium condition. This means that over the course of the full model run there is an average annual net NIIP groundwater depletion of 0 afy, which means that the total inflows to the NIIP groundwater (from NIIP return flows) will approximately equal the total outflows, which are assumed to be constant throughout the model run. Thus, the outflow rates on the NIIP groundwater objects must be calibrated such that this value is achieved. This can be an iterative calibration as changing the groundwater outflow will change the inflows available to the system to meet water user demands and SJRIP target baseflows, and thus can impact the required Navajo releases.

In a SJBHM Current Conditions run, it is assumed that the NIIP project results in a net annual average depletion of an additional 10,600 afy. Thus, the outflow rates on the NIIP groundwater objects must be calibrated such that this value is achieved. This can also require an iterative calibration.

Run Efficiency Considerations

Initialization Rules groups “Initialize Flows - Z Flags” and “Initialize ETAC and Interpolation/Disaggregation Method” take a significant amount of time to run and set final values as Z

flags. Unless inputs (flows, demands, etc) are changing, it is not necessary to have these groups on after they have been run once (Z flag values will remain). However, it is good measure to turn these on for any “final” type runs to make sure. Also, these do not differ between New vs Old Flow Recs.