Action name: Historical Streamflow Series **Prerequisite Actions:** None

Action Description:

Develop an historical stream flow series, derived from available USGS flow records and NPL operating records, for locations of interest. Locations of interest include the downstream and bypassed reaches associated with the developments listed below. These flow series may be used to characterize the flow regimes at these locations. Summary statistics (including mean flow, median flow, 7Q10 flow, etc.) may be calculated from these stream flow series.

Applicable Hydro Projects/Developments:

- Nantahala Project, FERC Project No. 2692
- West Fork Project, FERC Project No. 2686, Tuckasegee and Thorpe developments
- East Fork Project, FERC Project No. 2698, Cedar Cliff, Bear Creek, and Tennessee Creek/ Wolf Creek developments
- Mission Project, FERC Project No. 2619
- Franklin Project, FERC Project No. 2603
- Dillsboro Project, FERC Project No. 2602
- Bryson Project, FERC Project No. 2601

I. Objective

The objective of this study is develop historical inflow series for the projects as well as for locations of interest associated with these projects. More specifically, these inflow series must be accepted by consensus of the interested study participants. Acceptance is important because these inflow series will become the input data for several economic, operational, and habitat models which will be used to assess the interaction between project operations (including outflows and reservoir levels) and environmental objectives.

II. Basis

The ideal source for historical stream flow series is the USGS flow record, but there is very little long term USGS stream flow data available at the upper end of the project drainage basins. Therefore, it will be necessary to synthesize historical inflow series for many of these project locations

III. Geographic and Temporal Scope

The principle area of interest will be the East Fork multi-development project and the West Fork multi-development project both located on the Tuckasegee River as well as the Nantahala project located on the Nantahala River. Additionally, inflow series will be developed for the Mission, Franklin, Dillsboro and Bryson projects. The period of record for the inflow series will be as long as possible based on the available data to provide an inflow data base for subsequent economic and environmental modeling.

IV. Approach and Analysis

The method used to develop the historical inflow series for the subject projects is based in the reservoir inflows calculated from project operation records. Flows for downstream locations will be calculated by using a combination of these inflows, USGS gage records and USGS WSP 2403. Some valuable USGS stream flow data and calculated project inflow data has already been assembled. As the study progresses, methods and results will be discussed among the study participants in order to facilitate achieving consensus at the conclusion of the study.

Pre-study consultation with NCDWR has indicated that the department would like to compare summary statistics from the synthetic historical inflows with the summary statistics from flows for similar basins in order to confirm the suitability of the derived inflows. To this end, summary statistics will be computed. Some research on available software to perform these calculations has already been done, and several SAS programs provided by Jim Mead of DWR have been successfully applied to computed reservoir inflow data series.

V. Schedules and Required Conditions

Data collection and processing began in the spring of 2001. Inflow series are being generated for the reservoirs. These series will be presented along with summary statistics in June 2001. There will be on-going consultation as discussed in the **Approach and Analysis** section above.

The reservoir inflows required by the CHEOPS model (see study plan *Hydraulic and Operation Evaluation Model* – formerly NPLOTH6) must be ready by the end of June, 2001. The inflow series data to be used for computer modeling purposes will be provided in a format useable to the modelers.

VI. Results

The result of this study will be synthetic historical data series that are based on relevant stream flow and project operation data. The goal is to have the historical inflow series accepted by the study participants prior to use in subsequent studies. Summary statistics will be calculated to aid in achieving this consensus.

VII. Participants

	Organization	Name	Phone #	E-Mail
Duke Power Lead	Duke Power	Steve Gaffney	704-382-5415	srgaffne@duke-energy.com
Agency Contacts	NCDENR/DWR	Jim Mead	919-715-5428	jim.mead@ncmail.net
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	USFS	Richard Burns	828-257-4214	rgburns@fs.fed.us
Duke Power Supporting Consultant	DE&S	Chris Ey	704-382-6232	jcey@dukeengineering.com
Other Participants				

VIII.Expected Benefits

The benefit of this study will be accepted inflows which will be used for subsequent modeling of project operation and environmental interaction. By having agreed-to inflows for subsequent model studies, there will be no time lost to discuss the input data instead of the model outputs. This will keep the focus on the issues.

IX. List of Attachments:

N/A

X. List of References:

N/A