

Scope of Work for Sabine – Neches BBEST Technical Consultant

DRAFT 4/15/2009

1. Work with S-N BBEST to establish the flow periods that will comprise the selected flow regime and their definitions in terms of flow and recurrence interval (Wet, Normal, Dry, Subsistence). Work is expected to include, but is not limited to, the following:
 - a. Develop graphic(s) illustrating the periods of record for control points selected by the S-N BBEST showing drought of record, beginning of deliberate impoundment in major reservoirs, and times of any significant changes in major reservoir operations (e.g., pre- and post- installation of permanent saltwater barrier on lower Neches River).
 - b. For control points selected by the S-N BBEST where flows have been significantly affected by major reservoir development and operations, provide summaries of flow statistics in tabular and graphical formats to facilitate comparison of pre- and post- impoundment conditions. Such control points include: the Sabine River near Gladewater, Beckville (Tatum), Bon Weir, and Ruliff; the Neches River near Neches and Evadale; and Sabine Lake.
 - c. Provide recommendations of appropriate period(s) of record for statistical analyses of flow records prerequisite to development of consistent environmental flow regimes throughout the river basins.
2. Work with the S-N BBEST to identify the months comprising the seasonal periods for the Sabine and Neches Rivers and Sabine Lake. The seasonal periods for these rivers may or may not conform to traditional divisions. Work is expected to include, but is not limited to, the following:
 - a. For inland control points selected by the S-N BBEST and Sabine Lake, provide summaries of flow statistics in tabular and graphical formats for selected flow periods.
 - b. Statistical flow summaries shall include relevant monthly statistics to facilitate comparisons and S-N BBEST selection of appropriate seasonal periods.
3. Review and confirm the control points selected by the S-N BBEST.
 - a. Provide such review and confirmation within two (2) weeks of receipt of notice to proceed.
4. Work with the S-N BBEST to develop a flow regime for each of the control points selected by the S-N BBEST and for Sabine Lake (e.g. run HEFR). Work is expected to include, but is not limited to, the following:
 - a. Perform limited analyses of available cross-section data representative of selected control points to determine stage and flow at bank-full (imminent overbanking) conditions. Cross-section data is to be provided by the S-N BBEST. Assign a recurrence interval to bank-full flow estimates and document methodology used to assign recurrence interval.

- b. Apply hydrograph analysis tools and methodologies including, but not limited to, Indicators of Hydrologic Alteration (IHA) and Hydrology-Based Environmental Flow Regime (HEFR) at the direction of the S-N BBEST to support development of environmental flow regime recommendations.
 - c. Perform limited sensitivity analyses to assess the effects of intermediate parameter selections defining Instream (or Environmental) Flow Components in the applications of IHA and HEFR on potential environmental flow regime recommendations.
 - d. Integrate preliminary environmental flow regime recommendations for the Sabine River near Ruliff and Neches River at Evadale with comparable values for other freshwater inflows to the Sabine Lake Estuary and provide tabular and graphical comparisons with estuarine inflow recommendations developed by Texas Parks & Wildlife Department (TPWD) and Texas Water Development Board (TWDB).
5. Prepare WAM results under current conditions and naturalized flows at control points, and assess frequency and duration, of flow regime elements. Work is expected to include, but is not limited to, the following:
 - a. Assist the S-N BBEST with selection of appropriate hydrologic assumptions (e.g., current conditions), apply the Texas Commission on Environmental Quality (TCEQ) Water Availability Models (WAMs) of the Sabine and Neches River Basins, extract regulated flows at selected control points and the Sabine Lake Estuary, and provide statistical comparisons to natural flows.
 - b. Recognizing the differences between flow statistics derived from monthly (WAM) and daily (IHA/HEFR) data, provide information summarizing frequency and duration of subsistence, base, high pulse, and overbank flows by long-term comparisons of regulated and natural flows from the WAMs with potential environmental flow regime recommendations at selected control points and the Sabine Lake Estuary.
 - c. Convert time series of simulated freshwater inflow to the Sabine Lake Estuary (regulated and natural) to estimates of salinity in upper, mid, and lower Sabine Lake using TPWD/TWDB equations. Provide information summarizing frequency and duration of events exceeding upper and lower salinity bounds under regulated and natural flow conditions.
6. Provide visual and descriptive aids (e.g., graphs; photographs; GIS imagery; connectivity) for various flow rates at control points to the S-N BBEST to assist in evaluating the effects on stream biological communities, especially those chosen as indicator species.
7. As directed by the S-N BBEST, assist with preparation of interim and final reports related to various environmental flow regimes.
8. Attend and Participate in Meetings as needed:
 - a. Three (3) Sabine- Neches BBEST meetings.
 - b. Two (2) S-N BBEST subcommittee meetings.
 - c. Prepare & Present progress reports.
9. Maximum budget: not to exceed \$70,000.
10. Schedule: Completion of final report by August 7, 2009. Interim deliverable dates to be specified by S-N BBEST.