

Framework for SAC review of BBEST work products

Senate Bill 3 provides that “In accordance with the applicable schedule...the advisory group [EFAG], with input from the science advisory committee [SAC], shall review the environmental flow analyses and environmental flow regime recommendations submitted by each basin and bay expert science team. If appropriate the advisory group shall submit comments on the analyses and recommendations to the commission for use by the commission in adopting rules under Section 11.1471. Comments must be submitted not later than six months after the date of receipt of the analyses and recommendations.” Texas Water **Sec. 11.02362 (q)**, as added by SB 3.

Other potentially relevant provisions of the law, as added by SB 3, include:

- **Sec. 11.02362 (n):** “Each basin and bay expert science team [BBEST] shall submit its environmental flow analyses and environmental flow regime recommendations to the pertinent basin and bay area stakeholders committee, the advisory group [EFAG], and the commission [TCEQ]..... The ...advisory group may not change the environmental flow analyses or environmental flow regime recommendations of the basin and bay expert science team.”
- **Sec. 11.02361 (e):** “The science advisory committee [SAC] shall (1) serve as an objective scientific body to advise and make recommendations to the advisory group on issues relating to the science of environmental flow protection...”
- **Sec. 11.002 (15)** “Environmental flow analysis” means the application of a scientifically derived process for predicting the response of an ecosystem to changes in instream flows or freshwater inflows.
- **Sec. 11.002 (16):** “Environmental flow regime” means a schedule of flow quantities that reflects seasonal and yearly fluctuations that typically would vary geographically, by specific location in a watershed, and that are shown to be adequate to support a sound ecological environment and to maintain the productivity, extent and persistence of key aquatic habitats in and along the affected water bodies.
- **Sec. 11.02362(m):** “...In developing the [environmental flow] analyses and [environmental flow regime] recommendations, the science team [BBEST] must consider all reasonably available science, without regard to the need for the water for other uses, and the science team’s [BBEST’s] recommendations must be based solely on the best science available.”

Based on these provisions and the work done to date by the SAC, a set of over-arching questions has been formulated to guide the SAC review.

1. Do the environmental flow analyses conducted by the BBEST appear to be based on a consideration of all reasonably available science, without regard to the need for water for other uses?

- Has the BBEST identified and described available data and utilized these data appropriately in its work?
- To what extent has the BBEST employed novel research results, either from unpublished sources or from the efforts of its membership, and if so, are the data sources and methods adequately documented?
- Has the BBEST properly considered and applied results from the literature or elsewhere with respect to appropriateness for the basin, acceptance in the discipline, and consideration of alternatives?

2. Are the environmental flow analyses conducted by the BBEST grounded in a scientifically derived process for predicting ecosystem response to changes in instream flows or freshwater inflows? Are the conclusions supported by the data?

- What parameters do the BBEST employ to define and delineate the ecological environment, specifically with respect to:
 - parameters measuring ecosystem “health”
 - organisms selected
 - habitats and their delineation
 - measures of ecological function
 - geographical variation within the basin
- What quantitative or qualitative relations were employed to relate the state of the ecosystem, as parameterized above, to the level and variability of flows? What are the fundamental causal connections assumed to exist between flow and ecosystem? What level of validation has been established, and has predictive uncertainty been considered and quantified?
- Have ecosystem measures and associated flow relations with currency among scientists been rejected for application in the basin in favor of the selected analyses? What justification has the BBEST offered?

3. Do the environmental flow regime recommendations appear to be based solely on the best available science?

- To what extent has the BBEST considered factors extraneous to the ecosystem, especially societal constraints, such as other water needs?
- Were widely accepted scientific data and/or analyses discounted by the BBEST?

4. Do the environmental flow regime recommendations reasonably represent a schedule of flow quantities reflecting seasonal and yearly fluctuations that typically vary geographically, by specific location in the watershed?

- To what extent did the BBEST employ data on ecosystem measures in specifying flow levels? For which elements of the flow regime array?
- Has the BBEST provided environmental flow recommendations for multiple sites in the basin, or has a procedure for performing the necessary evaluations to derive such recommendations been prepared?
- If the recommendations were based primarily upon hydrological data, e.g., HEFR default results, what level of ecological judgment is applied to identifying the key regime components and their attainment statistics? What is its basis?

5. Did the BBEST establish that the environmental flow recommendations are adequate to support a sound ecological environment and to maintain the productivity, extent and persistence of key aquatic habitats in and along the affected water bodies?

- How is a sound environment defined and quantified for both riverine (lotic) and estuarine systems?
- Did the BBEST make assumptions regarding the current conditions of the bay and basin as to sound ecological environment? If so, how were the assumptions supported?
- Did this evaluation include sensitivity to levels and/or timing of flows?
- Did this evaluation include an assessment of uncertainty attaching to the ecosystem response to flow?
- How do sensitivity and uncertainty distribute within the flow regime array?

6. From a statewide perspective, what are the management attributes of the environmental flow recommendations?

- How do the procedure, its scientific basis and the resulting flow regime recommendations compare to those for other basins?
- Can these be readily utilized in the development of an adaptive management strategy? What variables would be necessary to monitor, and what would the requirements be for temporal and spatial coverage and resolution? How would the data be processed and displayed to evaluate the suitability of flow recommendations?