

**TO:** Board Members

**THROUGH:** Kevin Patteson, Executive Administrator  
Robert E. Mace, Ph.D., P.G., Deputy Executive Administrator, Water Science and Conservation  
Les Trobman, General Counsel

**FROM:** Ruben S. Solis, Director, Surface Water Resources Division

**DATE:** December 1, 2015

**SUBJECT:** Studies of Environmental Flows in the Brazos River and Associated Bay and Estuary System Basin and Bay Area

**ACTION REQUESTED**

Authorize the Executive Administrator to publish a Request for Qualifications for studies of environmental flows in the Brazos River and associated bay and estuary system.

**BACKGROUND**

Senate Bill 3 (80<sup>th</sup> Texas Legislature, 2007) created a stakeholder-driven process for identifying and quantifying flows needed to maintain sound rivers and estuaries in Texas. The process led to the adoption of flow standards between 2011 and 2014 by the Texas Commission on Environmental Quality for seven major basin and bay areas in Texas. The Senate Bill 3 process contains an adaptive management component which calls for continued studies to validate and refine the environmental flow analyses, recommendations, and standards, and to identify strategies to achieve those standards. The Brazos Basin and Bay Area Stakeholder Committee submitted its work plan for adaptive management to the Environmental Flows Advisory Group in November 2013. This work plan contains recommended studies and activities that, if implemented, will provide additional information for future rulemaking by the Texas Commission on Environmental Quality.

In 2013, the 83<sup>rd</sup> Texas Legislature appropriated funds to the Texas Water Development Board (TWDB) for the continued study of environmental flows. In 2014, the Board approved the use of this funding to implement 15 priority work plan studies in five basin and bay areas, including a comprehensive study conducted in the Brazos basin that was completed this year (Attachment A). This study provided the stakeholder committee with information to better define flow-

ecology relationships and to identify and evaluate strategies to help meet environmental flow standards.

### **KEY ISSUES**

The 84<sup>th</sup> Texas Legislature appropriated funds to the TWDB in its baseline budget for the Fiscal Year 2016-2017 biennium in support of Strategy A.1.1 Environmental Information for the purpose of the collection and analysis of environmental flow information to support a sound ecological environment in the state's streams, rivers, bays and estuaries. To support this strategy, TWDB staff sought input from Senate Bill 3 stakeholder committees by requesting that they submit for consideration a prioritized list of studies from work plans developed for their basins. These studies support Strategy A.1.1 by providing both monitoring and analyses of environmental flows information to address priority questions identified in their basins. The Brazos Basin and Bay Area Stakeholder Committee created a subcommittee to identify specific projects from their work plan to be recommended for funding. The full stakeholder committee approved the subcommittee's recommendations on October 23, 2015, and requested that TWDB fund this project. Staff is prepared to provide technical support and to administer the contracting of these funds for the priority project identified by the Brazos Basin and Bay Area Stakeholder Committee.

In summary, the Brazos Basin and Bay Area Stakeholder Committee requests that one study be funded for a total of \$300,000. The stakeholder committee requests the following study:

- Brazos basin environmental flow standard validation and integration of river flows and Brazos basin estuary response (\$300,000).

For more detailed descriptions of the requested study, please see *Attachment B: Project Descriptions for Proposed Fiscal Year 2016-2017 Studies for the Brazos Basin and Bay Area Stakeholder Committee*.

### **Contracting**

Upon receiving authorization, the Executive Administrator will initiate the vendor selection process by publishing the Request for Qualifications to conduct studies of environmental flows in the Brazos River and associated bay and estuary system for up to \$300,000. Review and final selection of a qualified firm will be presented for Board consideration at a future Board meeting.

**RECOMMENDATION**

The Executive Administrator recommends approval of this item.

This recommendation has been reviewed by legal counsel and is in compliance with applicable statutes and Board rules.

Attachment A: Fiscal Year 2014-2015 Work Plan Studies

Attachment B: Project Descriptions for Proposed Fiscal Year 2016-2017 Studies for the Brazos  
Basin and Bay Area Stakeholder Committee

**ATTACHMENT A**

**FISCAL YEAR 2014-2015 SENATE BILL 3 WORK PLAN STUDIES**

<b>Study Description</b>	<b>Contractor</b>	<b>Amount</b>
<b>Trinity, San Jacinto Basin and Bay Area</b>		
Defining bioindicators for freshwater inflow needs studies	Texas A&M University at Galveston	\$105,500
Determination of freshwater inflow volume from the Trinity River into Trinity Bay	U.S. Geological Survey	\$95,000
Trinity River evaluation of adopted Senate Bill 3 environmental flow standards	Trinity River Authority	\$112,000
<b>Brazos Basin and Bay Area</b>		
Brazos basin environmental flow standard validation and integration of river flows and Brazos basin estuary response	BIO-WEST, Inc.	\$312,500
<b>Colorado, Lavaca Basin and Bay Area</b>		
Studies to evaluate achievement of freshwater inflow standards and ecological response	Anchor QEA	\$250,000
Evaluation of potential strategies to help provide needed instream flows or freshwater inflows to support an ecologically sound stream or estuary	Meadows Center for the Environment	\$62,500
<b>Guadalupe, San Antonio Basin and Bay Area</b>		
Texas Instream Flows Program studies	San Antonio River Authority	\$200,000
Lower basin/estuarine inflow studies	University of Texas – Center for Research in Water Resources	\$200,000
<i>Rangia</i> clam investigations	San Antonio River Authority	\$150,000
Key estuarine faunal species studies	University of Texas Marine Science Institute	\$150,000
Strategy options for meeting attainment frequencies for the estuaries	San Antonio Bay Partnership	\$50,000
<b>Nueces Basin and Bay Area</b>		
Re-examination of the 2001 Agreed Order monthly targets and safe yield versus current demand evaluations	HDR, Inc.	\$45,000
Improve salinity modeling methods for determining environmental inflow regimes for Nueces Delta and Bay using a 3-D hydrodynamic model	University of Texas Center for Research in Water Resources	\$80,000
Explore land modifications to Nueces Bay and Nueces Delta	Naismith Engineering	\$95,000
Nueces watershed pre- and post-reservoir nutrient budgets	HDR, Inc.	\$92,500

## ATTACHMENT B

### PROJECT DESCRIPTIONS FOR PROPOSED FISCAL YEAR 2016-2017 STUDIES FOR THE BRAZOS BASIN AND BAY AREA STAKEHOLDER COMMITTEE

**Brazos basin environmental flow standard validation and integration of river flows and Brazos basin estuary response (\$300,000)** – The Brazos River and Associated Bay and Estuary System Basin and Bay Area Stakeholder Committee (Brazos BBASC) requests studies to assess the response of riverine fish species (both fluvial specialists and facultative species) and to quantify and integrate aquatic community (fish and nekton) responses within the riverine estuary to the instream flows as adopted by the Texas Commission on Environmental Quality environmental flow standards. Funding to be allocated to this activity is not expected to exceed \$300,000. The ability to tie biological responses to environmental flow is critical to validating the Brazos BBASC’s environmental flow recommendations for the lower Brazos River and its estuary. The proposed study area for environmental flow standard validation is from Waco to the Texas coast. Work may occur in the riverine estuary and at any, or all, of the following Brazos River environmental flow standard locations: U.S. Geological Survey (USGS) Gage #08096500, Brazos River at Waco; USGS Gage #08108700, Brazos River at SH 21 near Bryan; USGS Gage #08111500, Brazos River near Hempstead; USGS Gage #08114000, Brazos River at Richmond; and/or USGS Gage #08116650, Brazos River near Rosharon. At minimum, three sites in the estuary at or below Rosharon must be assessed. These studies will generate data across the range of adopted subsistence, base, and high flows at each of the above locations. These studies are highly dependent on the occurrence of specific flow levels. Work is not expected to occur at all of the stream sites listed above or across all flows in each site’s adopted flow regime but to occur at the flows provided. At a minimum, one assessment must occur per quarter in the estuary and one assessment from the above listed stream sites at one of the specified flow regime tiers regardless of whether the site is at subsistence, base, high or overbank flows. It is anticipated that every effort will be made to assess biotic responses to high and/or overbank flows regardless of when or where they occur. This study will seek to build on recent work performed for the *Instream Flows Research and Validation Methodology Framework and Brazos Estuary Characterization* (Brazos BBASC 2015) and other investigations regarding aquatic community success and the quantification/integration of aquatic community responses in the Brazos River and estuary to the environmental flow standards (Brazos BBASC 2015). The proposed study addresses information and data needs identified by the Brazos BBASC in their adaptive management work plan (Tasks 3.1.5 (*analysis of overbank flows*), 3.1.6 (*long-term study of water quality and estuarine health*), 3.1.7 (*analysis of flow recommendations at the Richmond gage #08114000*), and 3.1.11 (*community analyses of fish, mussels, and insects*)).

#### References

Brazos BBASC. 2013. *Work Plan for Adaptive Management: Submission to the Environmental Flows Advisory Group and the Texas Commission on Environmental Quality*. Prepared by the Brazos River and Associated Bay and Estuary System Basin and Bay Area Stakeholders Committee. July 2013, 35 p.

Brazos BBASC. 2015. *Instream Flows Research and Validation Methodology Framework and Brazos Estuary Characterization*. Prepared by Dr. Timothy Bonner (Texas State University), Dr. Jacquelyn Duke (Baylor University), Dr. George Guillen (Environmental Institute of Houston - University of Houston Clear-Lake), BIO-WEST, Inc., 223 p.