

Texas Water Development Board

# Implementation of Flood Legislation from the 86th Texas Legislative Session

*Issues for Stakeholder Consideration and Request for Feedback*



July 29, 2019

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July 29, 2019

Dear stakeholders:

The Texas Water Development Board (TWDB) is pleased to present issues for stakeholder consideration related to the implementation of flood-related legislation passed by the 86<sup>th</sup> Texas Legislature, including [Senate Bill \(SB\) 7](#), [SB 8](#), [SB 500](#), and [House Joint Resolution 4](#).

With the passage of this legislation, the 2019 Texas Legislature and Governor Abbott greatly expanded the TWDB's role in flood planning and financing. The TWDB will now be administering a new state flood planning program. This program establishes a state and regional flood planning process, with flood planning regions based on river basins. The first regional flood plans will be due in 2023, and the first state flood plan will be due September 1, 2024.

The legislature also authorized a one-time transfer of \$793 million from the state's Economic Stabilization or "Rainy Day" Fund to create a new flood funding program to be administered by the TWDB. The program is designed to make the implementation of drainage and flood projects more affordable for Texas communities and to meet immediate needs for funding. The funding will become available in 2020.

The TWDB is working to get these programs up and running as quickly as possible and to hire staff for these new roles. Prior to formal rulemaking activities this fall, we are seeking input on a variety of issues, including but not limited to:

- Administration of funding for flood control planning and drainage, flood mitigation, and flood control projects
- Creation of regional and state flood planning process and related requirements
- Potential flood planning region boundaries
- State and regional flood planning guidance principles

#### Our Mission

To provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water for Texas

#### Board Members

Peter M. Lake, Chairman | Kathleen Jackson, Board Member | Brooke T. Paup, Board Member  
Jeff Walker, Executive Administrator

July 29, 2019

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The information included in this packet is intended to generate discussion and to solicit specific feedback that will inform formal rulemaking and other implementation efforts. Written feedback is requested by August 30, 2019 and should be submitted to [rulescomments@twdb.texas.gov](mailto:rulescomments@twdb.texas.gov).

We will also be hosting stakeholder workshops around the state the first two weeks of August (see schedule in Attachment 1); these will include presentations on implementation efforts and issues for stakeholder consideration as well as opportunities for giving formal comments and for informal discussions with TWDB staff and board members.

We invite you to join us in these discussions and look forward to working with you over the coming months to create new state programs that will better protect Texans against the loss of life and property from flooding. For further information, feel free to contact us at (512) 463-8725 or [flood@twdb.texas.gov](mailto:flood@twdb.texas.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeff Walker', with a long, sweeping flourish extending to the right.

Jeff Walker  
Executive Administrator

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- Attachment 1: Flood Implementation Workshop Schedule
- Attachment 2: Texas River Basins Basics Map
- Attachment 3: Option A: Potential Flood Planning Region Boundaries Map
- Attachment 4: Option B: Potential Flood Planning Region Boundaries Map
- Attachment 5: Preliminary Outline for Flood Planning Rules

## SB 7: State Flood Funding Issues for Consideration

As provided by SB 7, HJR 4, and appropriations through SB 500, the new flood funding program will provide grants and low-cost loans for drainage, flood mitigation, and flood control projects.

### Issue 1: Form of Financial Assistance

SB 7 provides that financial assistance to political subdivisions can either be in the form of a grant, loan, or some combination of both. The program can provide a greater amount of total funding over time if a larger portion of financial assistance is in the form of low-interest loans, since loans are repaid by borrowers, unlike grants, which provide no repayment stream once they are awarded. For instance, if the TWDB provides financial assistance in the form of 75 percent grants and 25 percent loans at zero-percent, the total financial assistance amount available for recommitment in 20 years will be about \$198 million. In contrast, if the TWDB provides financial assistance in the form of 25 percent grants and 75 percent zero-interest loans, then the total amount available in 20 years will be \$593 million.

The following scenario charts provide examples of the amounts available over 5, 10, and 20-year time periods, using three different loan interest rate assumptions:

#### Scenario 1: 75 Percent Grants; 25 Percent Loans

Funding Available			
Time Period	0% Interest Rate	1% Interest Rate	2% Interest Rate
In 5 years	\$31,210,000	\$37,251,175	\$43,494,400
In 10 years	\$83,235,000	\$94,383,300	\$106,067,150
In 20 years	\$197,690,000	\$220,025,550	\$243,523,900

#### Scenario 2: 25 Percent Grants; 75 Percent Loans

Funding Available			
Time Period	0% Interest Rate	1% Interest Rate	2% Interest Rate
In 5 years	\$93,630,000	\$111,411,450	\$130,477,900
In 10 years	\$249,700,000	\$282,717,425	\$318,176,650
In 20 years	\$593,065,000	\$659,469,800	\$730,569,300

Given that the amount of funding is limited and the needs for financial assistance are significant:

- How should the TWDB determine the amount of grants versus loans?
- What is the maximum amount of a low-interest loan the TWDB can provide for this to be a viable program (low-interest, zero-interest, or some combination)?
- How should the TWDB evaluate an entity's ability to repay a loan in determining qualifications for grant funding?
- Should local match be required?

## **Issue 2: Prioritization System**

SB 7 provides that the TWDB is to prioritize projects based on a point system that is designed to prioritize projects that mitigate the loss of life and property due to flooding.

- What types of projects do you consider having the most impact mitigating loss of life and property?
- How can these criteria ensure the best use of state funds as a complement to local and federal funding?
- Should there be funding set aside for particular types of activities or projects?
- Should the program address needs for repair and rehabilitation of existing infrastructure that manages floodwaters?

Which of the following criteria should the TWDB use in its point system? Are there any additional criteria that should be added to this list?

1. Severity of existing potential flood risk hazard to life and property (using existing Flood Insurance Rate Maps [FIRMs])?
  - a) Associated with entity's overall jurisdiction?
  - b) Associated only with area benefitting from proposed project?
2. Flood risk reduction to life from project (what and how to measure?):
  - a) Expected reduction in flood fatalities (mitigation of loss of life)?
  - b) Population entirely removed from flood zone (including population within Special Flood Hazard Areas)?
  - c) (Existing population served by project) x (the average number of feet flood elevation reduction for those people)?
  - d) Emergency response benefits (open roads/communications/etc.)?
  - e) Reduction in number of critical facilities at risk (such as hospitals)?

- f) Reduction in likelihood of sudden infrastructure failure (residual risks associated with a levee)?
3. Flood risk reduction to property from project (what and how to measure?):
    - a) Value of property entirely removed from flood zone?
    - b) Relative percent of value of property removed from flood zone?
    - c) Reduction in flood depth for benefiting properties?
    - d) Protection of agricultural resources – reduction in flood depth/acreage inundated?
    - e) Reduction in likelihood of infrastructure failure (residual risks associated with a levee)?
  4. Benefit to cost ratio of project:
    - a) As simple threshold (e.g., must be >1.0), or
    - b) As sliding/weighted prioritization factor?
  5. Diverse urban/non-urban benefits (e.g., points for broad watershed project rather than individual community benefits)?
  6. Distribution of funds in terms of:
    - a) geography?
    - b) between river basins?
    - c) across population centers?
    - d) structural/nonstructural mitigation?
  7. Consider greater benefits of “regional” projects (includes multiple partners/jurisdictions within a watershed)?
  8. Area subject to repeated historical flood events (e.g., consideration of “repetitive loss” structures)?
  9. Recommended by existing multi-jurisdictional flood planning group?
  10. Meets high percentage of overall flood hazard risk mitigation needs (e.g., per hazard/flood mitigation plans) of the jurisdiction of the applicant?
  11. Provides benefits to neighboring watersheds?
  12. Annual Median Household Income (AMHI) associated with project? Or other socioeconomic index, such as a social vulnerability index? What geographical area should be considered to determine this?
    - a) Applicant jurisdiction? or
    - b) limited to only the benefitting area of project?
  13. Local contribution or other funding including non-state matching funds?
    - a) as percentage of overall project?

- b) as absolute dollar amount?
14. Emergency need for project?
  15. Readiness to proceed with actual construction phase of project (permits, plans & specs, agreements, etc. as required in statute)?
  16. Financial, managerial, and technical capacity of applicant to successfully implement and maintain the flood project?
  17. Water supply benefit of the flood project?
  18. Additional benefits to natural resources or other multiple benefits of the project?
  19. Expedites delivery of federal projects?
  20. Regulation of development in floodplain by applicant exceeds NFIP minimum standards?

### **Issue 3: What Projects Get Prioritized**

A prioritization system assumes that the TWDB will have a number of projects to prioritize at one time. The TWDB has experience with two priority systems; the system used for the State Water Implementation Fund for Texas (SWIFT) program and the system used for the Clean Water and Drinking Water State Revolving Fund (SRF) programs.

In the SWIFT system, the TWDB announces an annual call for applications. Political subdivisions submit an abridged application that gives the TWDB enough information to rank all the projects in that round of applications. After the projects are prioritized, the Board announces which applicants rank within funding availability. Selected applicants have a short period of time to prepare a full application, typically two to three months.

In the SRF system, the TWDB calls for information on all potential applicants that wish to seek funding in the following year. The TWDB gathers the information and ranks the projects in a published Intended Use Plan that serves as the priority list for the following year.

- Which system do you think would work best for flood financial assistance? Can you suggest an alternative method for prioritization, including any applications for federal financial assistance with prioritization systems that the TWDB could use as a model?
- Are there other program deadlines that should be considered when developing a funding cycle?

## **Issue 4: Property Buyouts**

Property buyouts are a tool that local communities use to minimize future flood damages to homes and businesses, often in frequently flooded areas.

- Should the financial assistance be available for political subdivisions that want to use the money to purchase private property to prevent future flood losses?
- How could state funds be used to complement federal buyout programs?
- What benefits should be considered when determining rank in project prioritization?
- What requirements for future land use should be placed upon properties that are bought out?

## **Issue 5: Memorandum of Understanding with All Other Political Subdivisions in the Watershed**

Texas statutes require that for flood control project funding, at the time of application, the applicant must have entered into a Memorandum of Understanding (MOU), similar to a contract, with all other political subdivisions in the watershed. TWDB staff suggests implementing this requirement as follows:

The applicant shall delineate the Project Watershed by estimating the area substantially affected by the proposed flood project both upstream and downstream of the project. The Project Watershed shall be estimated using the best available data with analysis performed in accordance with sound engineering principles and practices. The Project Watershed must be documented in the project application and signed and sealed by a licensed Professional Engineer. The TWDB will perform a technical review of the applicant's initial estimation of the affected area.

Estimates of the affected area may be revised as projects advance from planning to final design. Revisions may be necessitated by the collection of additional data, development of more refined modeling tools, refinement of design criteria, or other factors. Revisions are the responsibility of the applicant and are subject to review and approval by the TWDB. If a revision of the affected area results in the identification of additional political subdivisions affected by the project, the applicant is responsible for notifying those entities, seeking their cooperation, and documenting their cooperation via a revised MOU.

It is in the best interest of timely project completion to delineate the initial estimate of the affected area as accurately as possible and, when in doubt, to overestimate the

extent of the affected area and begin cooperation with political subdivisions within that area.

An MOU is not required for non-structural mitigation projects that do not divert, redirect, impede, or otherwise modify the flow of water.

- Do you have suggestions to improve this approach?
- What should the MOU contain and what other considerations would a political subdivision want to address in the MOU?

### **Issue 6: Flood Control Planning**

SB 7 allows for funding of “flood control planning,” including planning for flood protection; preparing applications for and obtaining regulatory approvals at the local, state, or federal level; activities associated with administrative or legal proceedings by regulatory agencies; and preparing engineering plans and specifications to provide structural or nonstructural flood mitigation and drainage.

- How can these activities be funded so that they are not duplicative of regional flood planning, to be implemented via SB 8 (see next section)?
- Should these activities be funded through the TWDB’s existing Flood Protection Planning grant program, provided that they coordinate with and do not duplicate regional flood planning activities?

### **Issue 7: What Have We Not Thought About?**

- What other issues do you see that the TWDB faces for this program?
- What other issues do potential program participants face?
- How do you suggest that we address those issues?

## **SB 8: State and Regional Flood Planning Issues for Consideration**

SB 8 creates the framework for the first state flood plan in Texas through the creation of regional flood planning groups to be delineated, guided, and supported by the TWDB. This process will be analogous to the regional water supply planning process that has been in place since 1997; however, the process will address statewide flood risks within the context of the geographic features and topography of watersheds rather than political boundaries.

The bill requires the TWDB to designate flood planning regions corresponding to each river basin, to provide financial and technical assistance to flood planning groups, and to adopt guidance principles for state and regional flood planning. The TWDB has the authority to divide river basins to avoid impracticably large areas for efficient planning. The TWDB will designate representatives from each flood planning region to serve in the initial planning group based on a process of solicitation for nominations, nomination review, and initial member selection by the TWDB. Once formed, the initial flood planning groups will be able to designate additional members.

The bill requires the regional flood planning groups to submit a regional flood plan to the TWDB by January 10, 2023 and requires the TWDB to prepare and adopt a comprehensive state flood plan before September 1, 2024, and every five years thereafter. The purpose of the plans will be to provide for orderly preparation and response to flood conditions, serve as a guide to state and local flood policy, and, when possible, contribute to water supply development. The state flood plan will incorporate regional flood plans submitted by flood planning groups established by the bill.

SB8 requires the state flood plan to include an evaluation of the condition and adequacy of flood infrastructure on a regional basis, a ranked statewide list of ongoing and proposed flood mitigation projects and strategies, an analysis of flood projects included in the previous state flood plans, an analysis of development in the 100-year floodplain, and legislative recommendations to facilitate flood control planning and project construction.

### **Issue 1: Planning Group Membership**

SB 8 requires that the initial flood planning group include adequate representation from the interests in its region, including the public, counties, municipalities, industries, agricultural interests, environmental interests, small businesses, electric generating utilities, river authorities, water districts, and water utilities. The flood planning group shall maintain adequate representation from those interests. In addition, the TWDB, the TCEQ, the General Land Office, the Parks and Wildlife Department, the Department of

Agriculture, the State Soil and Water Conservation Board, and the Texas Division of Emergency Management each shall appoint a representative to serve as an ex officio member of each flood planning group.

- Are the minimum membership requirements of the flood planning groups adequate or should there be additional voting or non-voting membership categories added to all of the flood planning groups? If so, what are the categories of membership?
- For major river basins that are split between flood planning groups, should those particular planning groups have an additional, non-voting member that acts as a liaison with the other planning group within that same river basin?

## **Issue 2: Planning Standards and Parameters**

SB 8 did not provide specific scale and scope parameters for the new planning process and did not provide definitions to distinguish drainage and stormwater issues from flooding. The proposed guidance principles (Issue 4) and the Preliminary Outline for Flood Planning Rules (Issue 7 and Attachment 4) provide starting points for discussion on these topics:

- What is the best way to incorporate a lower limit on the scale of flood projects that should be considered by regional flood planning process?
  - a. Minimum size of contributing watershed area?
  - b. Flood hazard risk threshold?
  - c. Size of flood mitigation project?
- What timeframe should the planning horizon cover (10 years, 20 years, 30 years, etc.) and how should the process address future growth, changing conditions, and uncertainties?
- What specific flood risk reduction goals and standards should the plans seek to achieve, and what is the acceptable level of risk that will remain even after the state goals are fully met?
- What flexibility should the planning groups have in determining the scale and scope of their plans, recognizing that all groups must meet certain minimum planning standards and criteria?

## **Issue 3: Planning Area Boundaries**

SB 8 specified that flood planning region boundaries be designated by the TWDB corresponding to river basins. Rulemaking is anticipated to include separate but overlapping processes for designating the initial flood planning group membership by the TWDB once flood planning boundaries are determined.

Included are three maps for reference and consideration:

- Attachment 2: Texas River Basin Basics map, for reference only, that displays all the river basins of Texas that underly and help explain the A and B Options
- Attachment 3: Option A: Potential Flood Planning Region Boundaries
- Attachment 4: Option B: Potential Flood Planning Region Boundaries

Considering the need to balance the necessary technical and administrative support for the planning groups with manageable TWDB staff workloads:

- How should the larger river basins be divided?
- How should the smaller river basins be combined with other basins?
- How should the coastal basins be addressed?

#### **Issue 4: Benefit-Cost Analysis**

Weighing the benefits (e.g., reduction in loss of life and damage to property) against the costs (e.g., capital investment plus operation and maintenance) of proposed flood projects:

- How should the benefit-cost ratio of proposed projects be considered?
- What are the pros and cons of different benefit-cost calculation methods?
- How do you think an associated reduction in loss of life should be reflected in such a benefit-cost evaluation?
- How should project success be defined?

#### **Issue 5: Neighboring Area Impacts**

SB 8 requires that the TWDB approve a regional flood plan if the agency determines that the plan does not negatively affect a neighboring area.

- Should there be an allowance to recommend a flood mitigation project that could result in negative impacts to a neighboring area so long as a flood planning group also incorporates a related but separate project to mitigate that negative impact?

#### **Issue 6: Flood Planning Guidance Principles**

Similar to regional and state water supply planning, SB 8 requires that the TWDB adopt guidance principles for the state flood plan that reflect the public interest of the entire state. The TWDB is required to review and revise the guidance principles, with input from the commission, the Department of Agriculture, the General Land Office, the Parks and Wildlife Department, the Texas Division of Emergency Management, and the State Soil and

Water Conservation Board as necessary and at least every fifth year to coincide with the five-year cycle for adoption of a new state flood plan.

The following preliminary guidance principles have been developed in coordination with the other agencies:

- Have these principles been crafted to adequately reflect the public interest of the entire state? Are there any that are missing?

Development of the regional and state flood plans shall be guided by the following principles. The regional and state flood plans:

- 1) shall be a guide to state, regional, and local flood risk<sup>1</sup> management policy.
- 2) shall focus on: identifying both current and future flood hazard exposure<sup>2</sup> and flood hazard risks<sup>3</sup>; selecting achievable flood risk hazard reduction goals, as determined by each flood planning group for their region; and incorporating strategies and projects to reduce the identified risks accordingly.
- 3) shall, at a minimum, evaluate *flood hazard exposure* to life and property associated with 0.2 percent annual chance (the 500-year flood) and, in these efforts, shall not be limited to consideration of historic flood events.
- 4) shall, at a minimum, evaluate *flood hazard risk* to life and property associated with 1.0 percent annual chance (the 100-year flood) and address, through recommended strategies and projects, the flood risk reduction goals of the regional flood planning group (per item 2 above) associated with a 1.0 percent annual chance (the 100-year flood); and, in these efforts, shall not be limited to consideration of historic flood events.
- 5) shall consider various types of flooding risks that pose a threat to life and property, including, but not limited to, riverine flooding, engineered structure failures, slow rise flooding, ponding, flash flooding, and coastal flooding.
- 6) shall be limited to include only flood mitigation strategies and projects with a contributing drainage area greater than or equal to 1.0 (one) square miles except in instances of flooding of critical facilities or routes of egress.

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<sup>1</sup> **Flood Risk** generally refers to the likelihood of consequences from flood events to life and property.

<sup>2</sup> **Flood Hazard Exposure** analysis involves a limited, high-level representation of flood risk. Flood Hazard Exposure describes, in general terms, who and what may be harmed by a flood hazard. It relies primarily on GIS tools and does not generally require extensive Hydrologic or Hydraulic modelling efforts.

<sup>3</sup> **Flood Hazard Risk** analysis provides sufficient information to determine the economic efficiency of alternative flood risk strategies to make strategy and project decisions and requires the availability of and extensive use of Hydrologic and Hydraulic models and takes into account *exposure* as just one of the factors. Flood Risk is typically expressed as a combination of the likelihood and consequence of an entire range of possible hydrologic events for a given area and produces, among other things, estimates of expected annual damage (EAD).

- 7) shall consider the potential upstream and downstream impacts, including environmental, of potential flood strategies (and associated projects) on neighboring areas. In recommending strategies, flood planning groups shall ensure that no neighboring area is adversely affected by the regional flood plan or that any anticipated negative impacts to a neighboring area are adequately mitigated through associated strategies in the regional flood plan.
- 8) shall include an assessment of existing flood infrastructure and will recommend both new strategies and projects that will further reduce risk, beyond what existing flood strategies and projects were designed to provide, and make recommendations regarding required expenditures to address deferred maintenance on or repairs to existing flood infrastructure.
- 9) shall include the estimate of costs and benefits at a level of detail sufficient for flood planning groups and sponsors of flood mitigation projects to understand project benefits and, when applicable, compare the relative benefits and costs, including environmental benefits and costs, between feasible options.
- 10) shall provide for the orderly preparation for and response to flood conditions to protect against the loss of life and property.
- 11) shall provide for an achievable reduction in flood risk at a reasonable cost to protect against the loss of life and property from flooding.
- 12) shall be supported by state agencies, including the TWDB, General Land Office, Texas Commission on Environmental Quality, Texas State Soil and Water Conservation Board, Texas Parks and Wildlife Department, and the Texas Department of Agriculture, working cooperatively to avoid duplication of effort and to make the best and most efficient use of state and federal resources.
- 13) shall include recommended strategies and projects that provide effective and economical management of flood risk to people, properties, and communities.
- 14) shall include strategies and projects that provide for a balanced consideration of structural and nonstructural flood risk mitigation measures, including projects that use nature-based features, that lead to long-term mitigation of flood risk.
- 15) shall contribute to water supply development where possible.
- 16) shall also follow all regional and state water planning guidance principles (31 TAC 358.3) in instances where recommended flood projects also include a water supply component.
- 17) shall be based on decision-making that is open to and accountable to the public with full dissemination of planning results except for those matters made confidential by law.
- 18) shall be based on established terms of participation that shall be equitable and shall not unduly hinder participation.
- 19) shall be based on the best available science, data, models, and flood mapping.

- 20) shall include flood risk mitigation strategies and projects recommended by the flood planning groups that are based upon identification, analysis, and comparison of all flood risk mitigation strategies the flood planning groups determine to be potentially feasible to meet flood hazard risk reduction goals.
- 21) shall consider land-use and floodplain management policies and approaches that support short- and long-term flood hazard risk reduction goals.
- 22) shall consider natural systems and beneficial functions of floodplains, including flood peak attenuation and ecosystem services.
- 23) shall work in accordance with the National Flood Insurance Program (NFIP) and shall not undermine participation in nor the incentives or benefits associated with the NFIP.
- 24) shall emphasize the fundamental importance of floodplain management policies that reduce flood risk.
- 25) shall, when possible, encourage flood mitigation design approaches that work with, rather than against, natural patterns and conditions of floodplains.
- 26) shall not cause long-term impairment to the designated water quality as shown in the state water quality management plan as a result of a recommended flood risk mitigation strategy or project.
- 27) shall be based on identifying common needs, issues, and challenges; achieving efficiencies; fostering cooperative planning with local, state, and federal partners; and resolving conflicts in a fair, equitable, and efficient manner.
- 28) shall include recommended strategies and projects that are described in sufficient detail to allow a state agency making a financial or regulatory decision to determine if a proposed action before the state agency is consistent with an approved regional flood plan.
- 29) shall include ongoing flood projects that are in the planning stage, have been permitted, or are under construction.
- 30) shall include legislative recommendations that are considered necessary and desirable to facilitate flood risk mitigation planning and implementation to protect life and property.
- 31) shall be based on coordination of flood risk mitigation planning, strategies, and projects with local, regional, state, and federal agencies projects and goals.

## **Issue 7: Preliminary Outline for Flood Planning Rules**

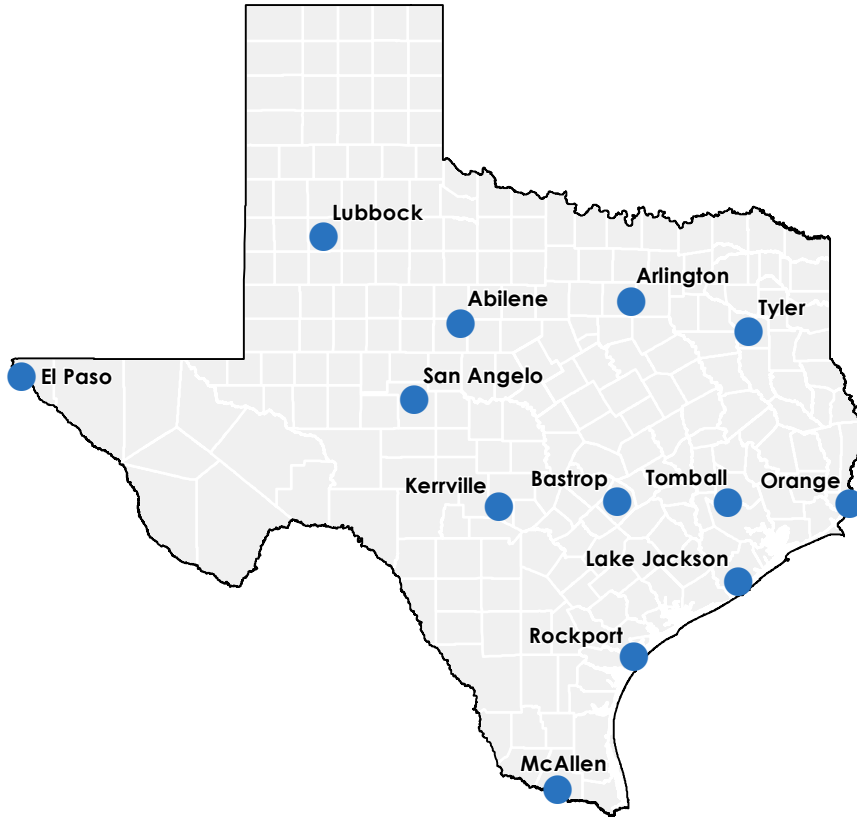
The TWDB has developed a preliminary outline for flood planning rules, included as Attachment 5, for stakeholder consideration. These rules will guide the development of the state and regional flood plans and will be the basis for technical guidance that will provide

additional information on the required methods, content, and format of information to be contained in each regional flood plan.

- What other issues do you see that the TWDB faces for this program?
- What other issues do the flood planning groups face?
- How do you suggest that we address those issues?

**Attachment 1:**  
**Flood Implementation Workshop**  
**Schedule**

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Date	Workshop details	
Tuesday, August 6	<b>LCRA Riverside Conference Center</b> 1405 Willow St. Bastrop, TX 78602 9:30-11:30 a.m.	<b>J. Michael &amp; Bridget Shahan Events Center at Lamar State College</b> 209 W. Green Ave. Orange, TX 77630 9:30-11:30 a.m.
Wednesday, August 7	<b>Ornelas Activity Center at The University of Texas at Tyler</b> 3402 Old Omen Rd. Tyler, TX 75707 9:30-11:30 a.m.	
Thursday, August 8	<b>El Paso Water's Tech2O Learning Center</b> 10751 Montana Ave. El Paso, TX 79935 9:30-11:30 a.m.	<b>Trinity River Authority General Office</b> 5300 S. Collins St. Arlington, TX 76018 9:30-11:30 a.m.
Friday, August 9	<b>McKenzie-Merket Alumni Center</b> 1666 University Ave. Lubbock, TX 79410 9:30-11:30 a.m.	<b>Beckendorf Conference Center at Lone Star College-Tomball</b> 30555 Tomball Pkwy. Tomball, TX 77375 9:30-11:30 a.m.
Tuesday, August 13	<b>Guadalupe Basin Natural Resource Center</b> Upper Guadalupe River Authority 125 Lehmann Dr. Kerrville, TX 78028 9:30-11:30 a.m.	<b>City of Lake Jackson Civic Center</b> 333 HWY 332 E. Lake Jackson, TX 77566 9:30-11:30 a.m.
Wednesday, August 14	<b>The Cactus Hotel</b> 65 E. Twohig Ave, 15 <sup>th</sup> floor San Angelo, TX 76903 9:30-11:30 a.m.	<b>Saltwater Pavilion at Rockport Beach</b> 210 Seabreeze Dr. Rockport, TX 78382 9:30-11:30 a.m.
Thursday, August 15	<b>Abilene Convention Center</b> 1100 N. 6 <sup>th</sup> St. Abilene, TX 79601 9:30-11:30 a.m.	<b>Texas A&amp;M Higher Education Center at McAllen</b> 6200 Tres Lagos Blvd. McAllen, TX 78504 9:30-11:30 a.m.

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**Attachment 2:  
Texas River Basin Basics Map**

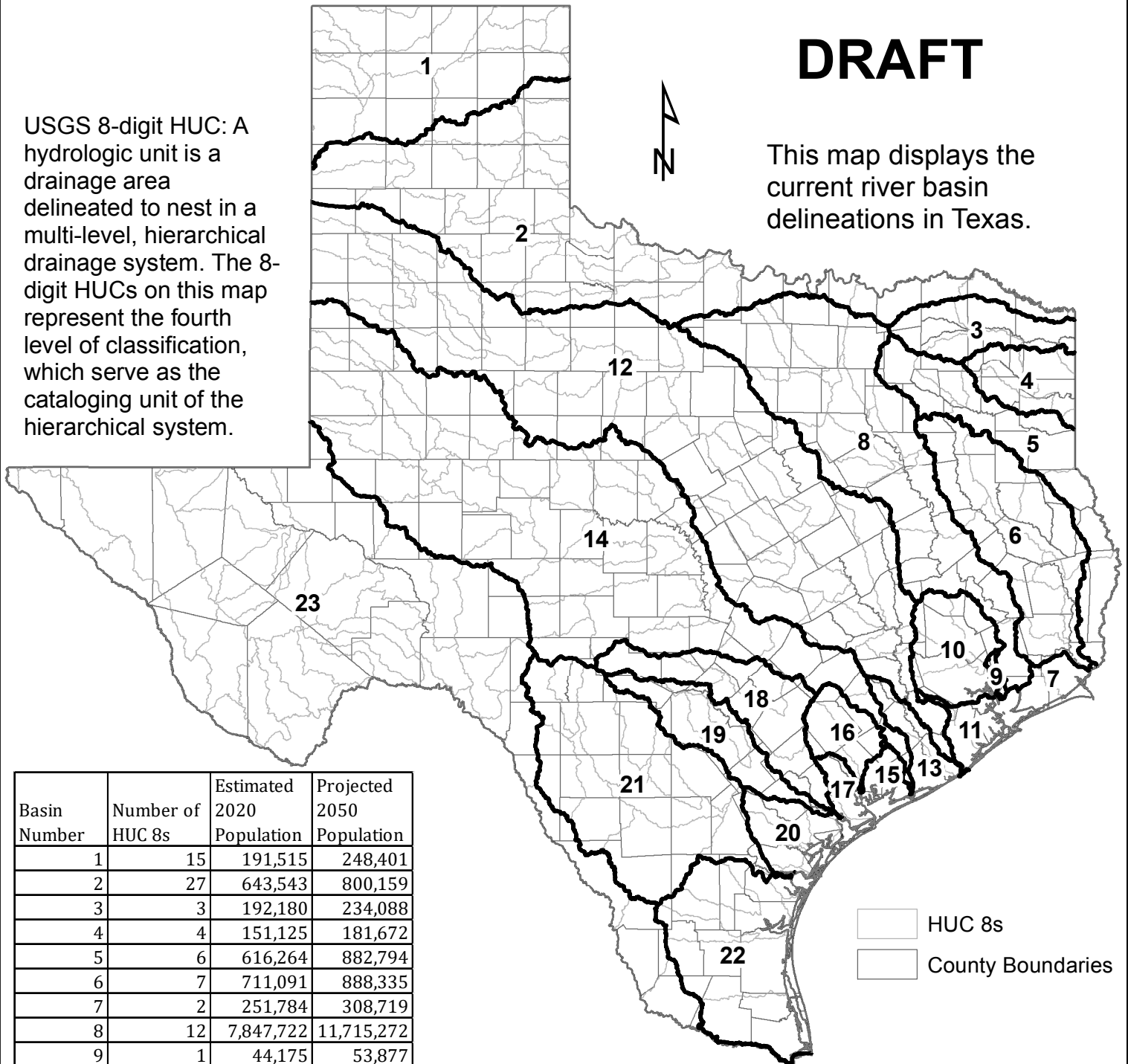
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# Texas River Basin Basics



## DRAFT

USGS 8-digit HUC: A hydrologic unit is a drainage area delineated to nest in a multi-level, hierarchical drainage system. The 8-digit HUCs on this map represent the fourth level of classification, which serve as the cataloging unit of the hierarchical system.

This map displays the current river basin delineations in Texas.



Basin Number	Number of HUC 8s	Estimated 2020 Population	Projected 2050 Population
1	15	191,515	248,401
2	27	643,543	800,159
3	3	192,180	234,088
4	4	151,125	181,672
5	6	616,264	882,794
6	7	711,091	888,335
7	2	251,784	308,719
8	12	7,847,722	11,715,272
9	1	44,175	53,877
10	4	5,377,145	7,186,082
11	2	1,272,500	1,720,836
12	25	3,144,341	4,564,273
13	2	87,535	129,990
14	26	2,337,661	3,434,347
15	1	25,547	28,797
16	2	50,943	55,727
17	2	53,432	65,905
18	4	616,025	996,499
19	4	2,225,335	3,117,098
20	4	126,912	136,182
21	11	235,751	302,664
22	8	1,918,153	2,967,811
23	36	1,562,992	2,253,606

 HUC 8s  
 County Boundaries

### Major River Basins

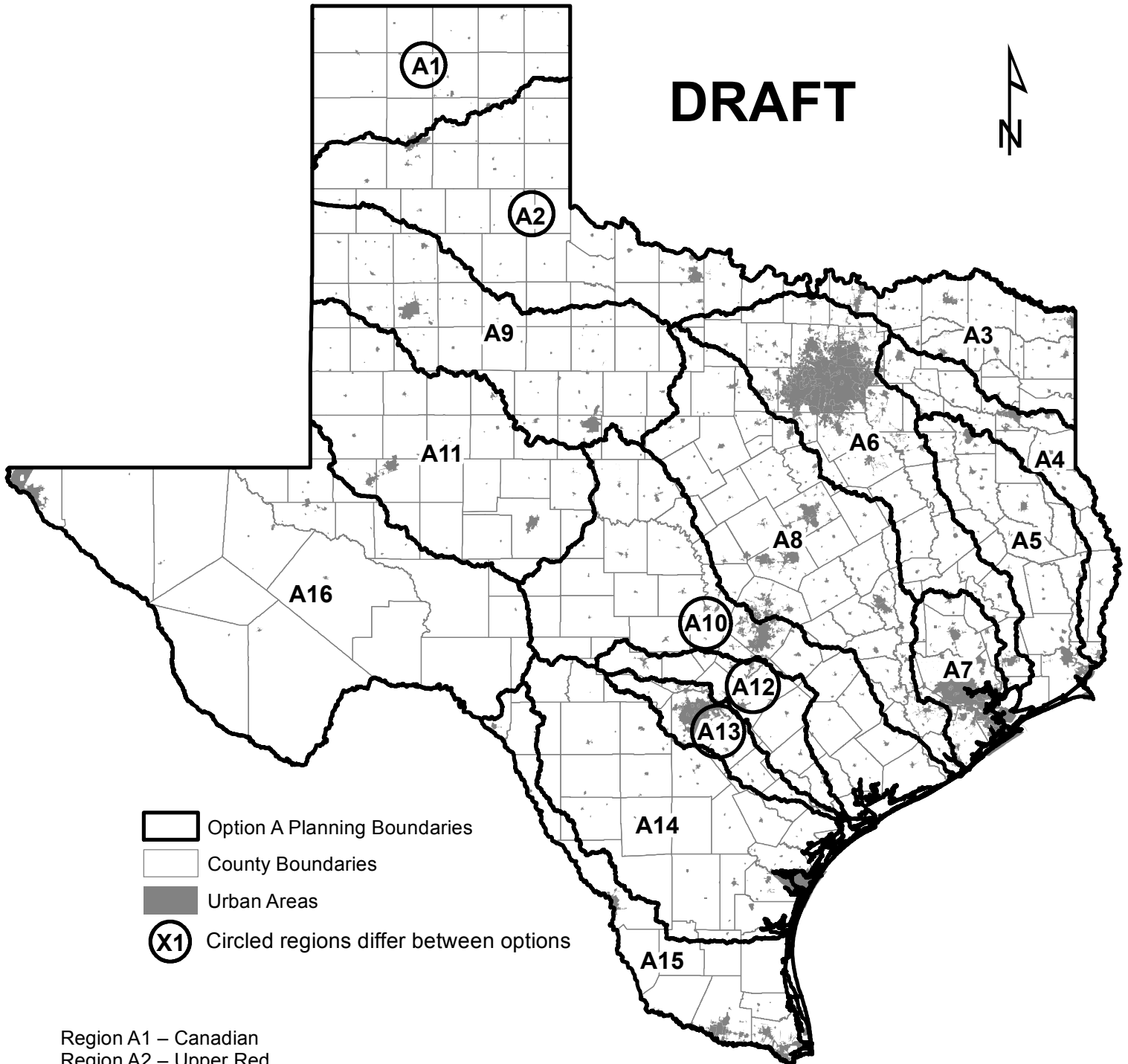
- |                   |                        |                        |
|-------------------|------------------------|------------------------|
| 1. Canadian       | 9. Trinity-San Jacinto | 17. Lavaca-Guadalupe   |
| 2. Red            | 10. San Jacinto        | 18. Guadalupe          |
| 3. Sulphur        | 11. San Jacinto-Brazos | 19. San Antonio        |
| 4. Cypress        | 12. Brazos             | 20. San Antonio-Nueces |
| 5. Sabine         | 13. Brazos-Colorado    | 21. Nueces             |
| 6. Neches         | 14. Colorado           | 22. Nueces-Rio Grande  |
| 7. Neches-Trinity | 15. Colorado-Lavaca    | 23. Rio Grande         |
| 8. Trinity        | 16. Lavaca             |                        |

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**Attachment 3:**  
**Option A: Potential Flood Planning Region**  
**Boundaries Map**

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# Option A: Potential Flood Planning Region Boundaries



## Factors in boundary selection:

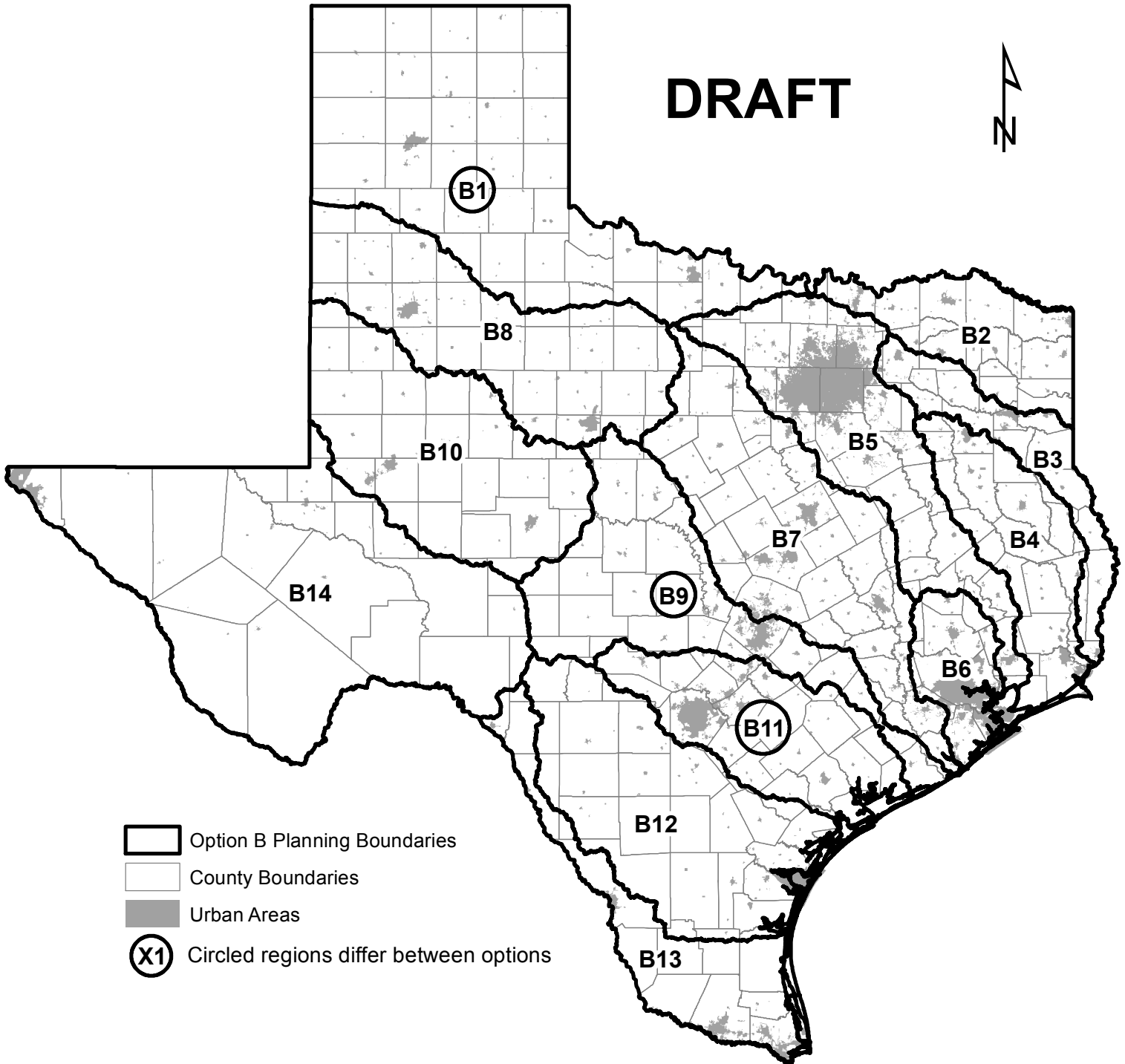
- Overall number of regions: 16
- Coastal basins were combined with an adjacent mainstem river basin based on:
  - potential to be influenced by interbasin flooding
  - ongoing coastal management efforts
  - stream contributions to bays
- Large river basins (Rio Grande, Colorado, Brazos, Red) were divided:
  - where existing reservoirs provided a clear break point
  - while preserving USGS HUC-8 boundaries
- Small river basins (Cypress, Lavaca, Sulphur) were combined with larger basins based on:
  - similar types of flooding
  - small populations
  - potential administrative constraints

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**Attachment 4:**  
**Option B: Potential Flood Planning Region**  
**Boundaries Map**

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# Option B: Potential Flood Planning Region Boundaries



- Region B1 – Canadian-Upper Red
- Region B2 – Lower Red-Sulphur-Cypress
- Region B3 – Sabine
- Region B4 – Neches
- Region B5 – Trinity
- Region B6 – San Jacinto
- Region B7 – Lower Brazos-San Bernard
- Region B8 – Upper Brazos
- Region B9 – Lower Colorado
- Region B10 – Upper Colorado
- Region B11 – San Antonio-Guadalupe-Lavaca
- Region B12 – Nueces
- Region B13 – Lower Rio Grande
- Region B14 – Upper Rio Grande

## Factors in boundary selection:

- Overall number of regions: 14
- Coastal basins were combined with an adjacent mainstem river basin based on:
  - Potential to be influenced by interbasin flooding
  - ongoing coastal management efforts
  - stream contributions to bays
- Large river basins (Rio Grande, Colorado, Brazos, Red) were divided:
  - where existing reservoirs provided a clear break point
  - while preserving USGS HUC-8 boundaries
- Smaller river basins (Canadian, San Antonio, Guadalupe, Sulphur, Cypress, Lavaca) combined with larger basins based on:
  - local flooding concerns, resource constraints, and population
  - similar types of flooding
  - small populations
  - potential administrative constraints
  - preserving certain municipal boundaries (Amarillo, Victoria)

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# Attachment 5: Preliminary Outline for Flood Planning Rules

## CHAPTER 391 REGIONAL FLOOD PLANNING

### SUBCHAPTER A GENERAL INFORMATION

#### §391.10 Definitions and Acronyms

**Flood Mitigation Strategy (FMS)** - A plan to manage flood hazard risk. A flood mitigation strategy may or may not require associated Flood Mitigation Strategy Projects to be implemented.

**Flood Mitigation Strategy Project (FMSP)** - Flood project that has a non-zero capital costs and that when implemented would address a flood hazard risk.

**HUC** - Hydrologic Unit Code level (e.g., HUC8) as delineated by the United States Geological Survey.

**Flood Risk** - generally refers to the likelihood of consequences from flood events to life and property.

**Flood Hazard Exposure Assessment** - describes, in general terms, who and what may be harmed by a flood hazard.

**Flood Hazard Risk Assessment** - analysis provides sufficient information to determine the economic efficiency of alternative flood risk strategies to inform strategy and project decisions and requires the availability of and extensive use of hydrologic and hydraulic models. Analysis takes into account exposure as just one of the factors.

#### §391.11 Designations of Flood Planning Regions

##### **[\*SEE ACCOMPANYING MAPS IN ATTACHMENTS 3 AND 4 FOR POTENTIAL FLOOD PLANNING REGION BOUNDARIES\*]**

Flood planning region boundaries will be designated by the TWDB and will be based on river basins or combinations of river basins or subdivisions of basins all following watershed boundaries. Rulemaking is anticipated to include separate but overlapping processes for designating the initial flood planning group membership by Board once flood planning boundaries are determined.

These processes are anticipated to be carried out in a manner similar to that used in implementing Senate Bill 1 Regional Water Planning whereby rules, planning region boundaries, and initial planning group membership occur simultaneously under

separate processes. Rules to require periodic review of regional boundaries with the potential to modify flood planning region boundaries.

**Membership** - Flood planning groups shall maintain at least one representative of each of the following interest categories as voting members of the flood planning group. However, if a flood planning region does not have an interest on the category below, then the flood planning group shall so advise the Executive Administrator and no membership designation is required.

- a) Public, defined as those persons or entities having no economic interest in the interests represented by the remaining membership categories other than as a normal consumer;
- b) Counties, defined as the county governments for the 254 counties in Texas;
- c) Municipalities, defined as governments of cities created or organized under the general, home-rule, or special laws of the state;
- d) Industries, defined as corporations, partnerships, sole proprietorships, or other legal entities that are formed for the purpose of making a profit and which produce or manufacture goods or services and which are not small businesses;
- e) Agricultural interests, defined as those persons or entities associated with the production or processing of plant or animal products;
- f) Environmental interests, defined as those persons or groups advocating the conservation of the state's natural resources, including but not limited to soil, water, air, and living resources;
- g) Small businesses, defined as corporations, partnerships, sole proprietorships, or other legal entities that are formed for the purpose of making a profit, are independently owned and operated, and have fewer than 100 employees or less than \$1 million in gross annual receipts;
- h) Electric generating utilities, defined as any persons, corporations, cooperative corporations, or any combination thereof, meeting each of the following three criteria: own or operate for compensation equipment or facilities which produce or generate electricity; produce or generate electricity for either wholesale or retail sale to others; and are neither a municipal corporation nor a river authority;
- i) River authorities, defined as any districts or authorities created by the legislature which contain areas within their boundaries of one or more counties and which are governed by boards of directors appointed or designated in whole or part by the governor or board;
- j) Water Districts, defined as any districts or authorities, created under authority of either Texas Constitution, Article III, §52(b)(1) and (2), or Article XVI, §59 including districts having the authority to regulate the spacing of or production from water wells, but not including river authorities; and

- k) Water Utilities, defined as any persons, corporations, cooperative corporations, or any combination thereof that provide water supplies for compensation except for municipalities, river authorities, or water districts.
- l) Additional representatives to ensure adequate representation from the interests in the region.

The flood planning groups shall add the following non-voting members, who shall receive meeting notifications and information in the same manner as voting members:

- o Staff member of the TWDB to be designated by the Executive Administrator;
- o Staff member of the Texas Commission on Environmental Quality designated by its commissioner,
- o Staff member of the General Land Office designated by its commissioner,
- o Staff member of the Texas Parks and Wildlife Department designated by its executive director;
- o Staff member of the Texas Department of Agriculture designated by its commissioner,
- o Staff member of the State Soil and Flood Conservation Board designated by its executive director;
- o Staff member of the Texas Division of Emergency Management designated by its chief; and
- o [Considering also including] Member liaisons designated by each Flood Planning Group representing portions of split major river basins to coordinate between the upstream and downstream Flood Planning Regions within that same river basin.

### **§391.12 General Flood Planning Group Responsibilities and Procedures**

To require the following activities of each flood planning group:

- a) Designate a political subdivision as a representative of the flood planning group eligible to apply for financial assistance for scope of work and Request for Proposal development
- b) Hold at least one required initial public meeting at a central location readily accessible to the public within the flood planning region to gather suggestions and recommendations from the public as to issues, provisions, projects, and strategies that should be addressed or provisions that should be considered for inclusion in the next regional or state flood plan
- c) Prepare a Scope(s) of Work for regional flood planning grant funding and approve amendments to the Scope(s) of Work as necessary
- d) Hold a public meeting to identify potential flood hazard mitigation goals
- e) Hold a public meeting to identify potentially feasible flood mitigation strategies and projects that the flood planning group may consider

Each flood planning group and any committee or subcommittee of the group are subject to Chapters 551 (relating to Open Meetings) and 552 (relating to Public Information), Government Code.

Provide the option for simplified flood planning to any flood planning region that consider their flood mitigation measures adequate to ensure the protection of life and property in their region.

### **§391.13 Flood Planning Group Deliverables**

Flood planning groups shall deliver draft and final regional flood plans that will contain the results of the required activities under 31 TAC 391 including a variety of Geographic Information System (GIS) deliverables and other data, tables, charts, maps, and written summaries of results in a form to be required by TWDB guidance documents. This information will provide the basis for much of the development of the state flood plan.

Each regional flood plan will include a single, standardized table that will include a list of all the recommended flood mitigation projects, and certain key information associated with each, as required by TWDB, and that will be the basis for TWDB prioritizing recommended flood mitigation projects in the state flood plan.

The flood planning groups will also deliver certain Technical Memorandums, established deliverables, and updates to the Board throughout the planning process to demonstrate progress in developing its regional flood plan in accordance with their contracts, rule, and statute, and to support the development of the state flood plan.

## **SUBCHAPTER B GUIDANCE PRINCIPLES AND NOTICE REQUIREMENTS**

### **§391.20 Guidance Principles for State and Regional Flood Planning**

Regional flood planning guidance principles will be the same as the state flood planning guidance principles. Rules to include periodic review of guidance principles with the potential to modify the guidance principles

### **§391.21 Notice and Public Participation**

General notice and public participation requirements are anticipated to be simpler but generally similar in scope and nature to those guiding regional water planning groups and the regional water planning process. Including:

- a) Flood planning groups and any subcommittees being subject to Chapters 551 and 552, Government Code;
- b) Provision of materials available to the public prior to meetings and decision-making;

- c) Public notice content including dates, places, and agendas;
- d) Minimum prior, posted, public notice of 72 hours for regular flood planning group meetings and 30 days notice for certain hearings;
- e) Mailed meeting and hearing notices and posted of notices;
- f) Provision of meeting materials and draft plans for public inspection and acceptance and consideration of public comments for certain deliverables.

### **§391.22 General Considerations for Development of Regional Flood Plans**

Flood planning groups are expected to consider a wide variety of available, relevant information when developing regional flood plans including:

- a) flood data, models, and maps,
- b) flood risk exposure assessments and flood hazard risk analyses,
- c) existing regional and local flood planning studies and flood mitigation plans;
- d) flood mitigation best management practices; and,
- e) any other relevant information.

## **SUBCHAPTER C PLANNING ACTIVITIES FOR FLOOD RISK MANAGEMENT NEEDS ANALYSIS AND FLOOD STRATEGY RECOMMENDATIONS**

### **§391.30 Description of the Flood Planning Region**

General summary of the region's historic floods, major flood risks to lives and property, and economic activity, population centers, political subdivisions, entities engaged in flood mitigation activities, socioeconomics, agricultural and natural resources, and current preparations for flooding events.

- a) social and economic aspects of the region such as information on current population, economic activity and economic sectors at risk of flood impacts;
- b) summary of historical flood events within the region
- c) political subdivisions with flood authority;
- d) Inventory of land use and local regulation and development codes relevant to flood infrastructure implementation;
- e) the areas in the flood planning region that are generally prone to flood;
- f) agricultural and natural resources;
- g) summary of existing local and regional flood plans;
- h) current preparations for flooding within the FPR;
- i) relevant information compiled by TWDB.

### **§391.301 Description of the Existing Flood Infrastructure in the Region**

A general description and inventory of various types of operational and non-operational flood infrastructure that exist within the flood planning region to include separate summary of new flood infrastructure currently under construction.

Information on infrastructure to include the type of flood infrastructure, purpose,

location, benefitting/impacting watersheds, owner and/or operator, and available information on the condition and functionality of the infrastructure.

### **§391.31 Land Use and Population**

Based on best available and actionable data, analyze historic, current, and projected land-use and population in the region regarding flood risks. To include a general description of factors impacting future flood risk, including but not limited to population change, land use change, transportation planning, precipitation patterns, relative sea level rise, subsidence, or other natural influences. Future flood risk shall be assessed for at least a 20-year planning horizon. Regional flood planning groups may consider longer time frames and other factors such as fully built out conditions. Population projections to be based on most recently Board-adopted regional and state water plan projections data. Population estimates to be based on county-level census data and estimated HUC8 splits.

### **§391.321 Flood Hazard Exposure Analysis**

Flood planning groups shall perform a region-wide, high-level assessment of who and what might be harmed by a flood event with a 0.2 percent annual chance (500-yr flood) using a consistent methodology as determined by the TWDB. Affected population centers, population, private and public structures, critical facilities, crops, and other relevant resources should be considered. To include a qualitative description of loss of function, which is the effect that a flood event could have on the function of inundated structures (residential, commercial, industrial, public, or others) and infrastructure, such as transportation, health and human services, water supply, wastewater treatment, utilities, energy generation, and emergency services.

### **§391.322 Flood Hazard Risk Analysis**

For areas within each flood planning region where hydrologic and hydraulic models are available, flood planning groups shall collect available flood risk analyses results and/or perform its own analyses of the different types, durations, and magnitude of flood related risks associated, at a minimum, with flood events with a 1.0 percent annual chance (100-yr flood). Analysis shall be in terms of hazard, performance, exposure, vulnerability, and consequences and shall include estimates of potential lives threatened and estimates of expected annual damage.

### **§391.323 Determining Flood Hazard Risk Reduction Goals**

Based on the flood risk exposure analyses and flood risk assessments, flood planning groups with input from the public, will identify specific and achievable flood hazard risk reduction goals for the flood planning region including identifying the acceptable level of risk that will remain even after flood risk reduction goals are fully met. These goals shall be structured and presented in an easily understood format in accordance

with TWDB guidance and will be used to guide the flood planning group's identification, evaluation, and recommendation of feasible flood risk mitigation strategies and projects.

### **§391.33 Flood Mitigation Strategy and Project Targeting**

Based on flood risk reduction goals and any available screening-level modeling, perform an analysis of current flood infrastructure and flood risk factors to determine the geographic areas that have insufficient flood mitigation for the purpose of focusing efforts to identify and evaluate potentially feasible flood mitigation strategies and projects.

### **§391.34 Identification and Evaluation of Potentially Feasible Flood Mitigation Strategies and Flood Mitigation Strategy Projects**

Using previous analyses, including any screening-level approaches, flood planning groups shall identify and evaluate potentially feasible flood mitigation strategies and the flood mitigation projects required to implement those strategies. Evaluations will rely on the use of hydrologic and hydraulic modelling to evaluate flood hazard risk reductions achieved by various options/configurations. The benefits and costs of the associated strategies and projects will be estimated to determine benefit-cost ratios.

Evaluations of potentially feasible flood mitigation strategies and associated flood mitigation strategy projects shall include the following analyses:

- a) The specific flood hazard risk reduction goal supported by the feasible strategy/project.
- b) A determination of whether strategy/project meets an emergency need.
- c) An equitable comparison between and consistent evaluation and application of all Flood Mitigation Strategy Projects the Flood Planning Groups determined to be potentially feasible to reduce flood hazard risk.
- d) A quantitative reporting of the estimated benefits of the strategy/project including reduction in fatalities and property protected including changes to expected annual damage due to strategy/project.
- e) A quantitative reporting of the estimated capital costs of strategy/project, if any.
- f) Information regarding the regional flood plan's anticipated impact on other resources of the state including other flood mitigation strategies and projects.
- g) Demonstration how the strategy/project will not result in negative impacts on neighboring areas.
- h) Indication regarding the use of federal funds as a component of total funding mechanism.
- i) For projects that will contribute to water supply, all evaluations as appropriate, required under §357.34(e).

j) Other factors as deemed relevant by the flood planning group including agricultural, environmental, or recreational impacts.

### **§391.35 Recommended and Alternative Flood Mitigation Strategies and Flood Mitigation Strategy Projects**

Flood planning groups shall recommend flood mitigation strategies (and the flood mitigation strategy projects required to implement those strategies) to reduce flood hazard risk based on the potentially feasible strategies and projects evaluated under §391.34 of this title. Recommendations shall be based upon the identification, analysis, and comparison of flood mitigation strategies/projects that the flood planning group determines are potentially feasible so that the cost-effective flood mitigation strategies/projects that provide measurable flood hazard risk reductions in support of specific flood hazard risk reduction goals are considered and adopted unless a flood planning group demonstrates that adoption of such flood mitigation strategies/projects is inappropriate.

The regional flood plan may include alternative flood mitigation strategies/projects also evaluated by the processes described in §391.34 of this title. For flood projects that will contribute to water supply, those recommended projects may not result in an overallocation of a water source based on the water availability allocations in the currently adopted State Water Plan.

## **SUBCHAPTER D IMPACTS, FLOOD RESPONSE, POLICY RECOMMENDATIONS, AND IMPLEMENTATION**

### **§391.40 Impacts of Regional Flood Plan**

To include a region-wide summary of the reduction in flood hazard risk that implementation of the regional flood plan would achieve and a discussion of impacts of the recommended strategies/projects within the flood planning region and between flood planning regions. The plan shall include a finding that the regional flood plan and projects do not adversely affect neighboring areas or that any anticipated negative impacts to a neighboring area are adequately mitigated through associated strategies/projects in the regional flood plan.

### **§391.41 Contribution to water supply development**

To include a region-wide summary of the contribution that the regional flood plan would have to water supply development and whether that contribution is consistent with the state water plan.

### **§391.42 Flood Response Information, Activities, and Recommendations**

General discussion of flood response preparations in the region including how the regional flood plan will improve and/or reduce the need for response to flood events.

### **§391.43 Regulatory, Administrative, or Legislative Recommendations**

Flood planning groups shall develop and include in their flood plans legislative recommendations that they consider necessary to facilitate flood mitigation planning and implementation.

### **§391.44 Flood Infrastructure Financing Analysis**

Flood planning groups shall assess (e.g., via surveys of project sponsors) and quantitatively report on how individual local governments, regional authorities, and other political subdivisions in their region propose to finance recommended flood mitigation strategy projects.

### **§391.45 Implementation and Comparison to Previous Regional Flood Plan**

General description of how the new regional flood plan differs from the previous plan including with regard to the flood hazard goals, risk reduction achieved, and recommended projects.

## **SUBCHAPTER E ADOPTION, SUBMITTAL, AND AMENDMENTS TO REGIONAL FLOOD PLANS**

### **§391.50 Adoption, Submittal, and Approval of Regional Flood Plans**

This process is anticipated to follow a path that is generally similar to that of the regional water planning process.

### **§391.51 Amendments to Regional Flood Plans**

This process is anticipated to follow a path that is generally similar to that of the regional water planning process.

## **SUBCHAPTER F CONSISTENCY AND CONFLICTS IN REGIONAL FLOOD PLANS**

### **§391.60 Consistency of Regional Flood Plans**

This is anticipated to be generally analogous to the consistency requirements of the regional water plans.

### **§391.61 Intraregional Conflicts in Development of Regional Flood Plans**

This process is anticipated to follow a path that is generally similar to that of the regional water planning process.

### **§391.62 Interregional Conflicts**

This process is anticipated to follow a path that is generally similar to that of the regional water planning process.

### **§391.63 Failure of a Regional Flood Plan to Meet Regional Flood Planning Requirements**

This process is anticipated to follow a path that is generally similar to that of the regional water planning process.

### **§391.64 Conflicts Between Regional Flood Plans and Local Flood Plans**

This process is anticipated to be generally similar to that of the regional water planning process.

## **CHAPTER 392 STATE FLOOD PLANNING GUIDELINES**

The state flood plan development process is anticipated to be analogous to the development of the state water plan which relies heavily on information provided in the regional water plans.

### **SUBCHAPTER A STATE FLOOD PLAN DEVELOPMENT**

#### **§392.1 Applicability**

This subchapter governs the Board's preparation, development, formulation, and adoption of the state flood plan.

#### **§392.2 Definitions**

To be determined.

#### **§392.3 Guidance Principles - [\*SEE SB 8 ISSUE 6 FOR GUIDANCE PRINCIPLES\*]**

Regional flood planning guidance principles will be the same as the state flood planning guidance principles and will be revisited every five years.

#### **§392.4 Guidelines**

The state flood plan development process is anticipated to be analogous and similar in relative timing to the development of the state water plan which relies heavily on the information provided in the regional water plans.

### **SUBCHAPTER B DATA COLLECTION**

#### **§392.5 Data Collection**

To address additional data collection needs to support state flood planning.

## **CHAPTER 355 RESEARCH AND PLANNING FUND [TO BE CONFIRMED]**

## **SUBCHAPTER E REGIONAL FLOOD PLANNING GRANTS**

New subchapter to address flood planning funding

### **§355.120 Applicability and Definitions**

This process is anticipated to be generally similar to that of the state water planning process and incorporated into the existing rules related to the research and planning fund.

### **§355.121 Notice of Funds and Submission and Review of Regional Flood Planning Applications**

This process is anticipated to follow a path that is generally similar to that of the state and regional water planning process.

### **§355.122 Use of Funds**

This is anticipated to be generally similar to that of the state and regional water planning process.

### **§355.123 Board Consideration of Applications; Applicant's Responsibilities and Contract**

This process is anticipated to follow a path that is generally similar to that of the state and regional water planning process.