6. Regulatory, Administrative, Legislative, and Other Recommendations

The Texas Water Development Board (TWDB) regional water planning guidelines [1] require that a regional water plan include recommendations for regulatory, administrative, and legislative changes that will facilitate water resource development and management:

> "357.7 (a) Regional water plan development shall include the following… (9) regulatory, administrative, or legislative recommendations that the regional water planning group believes are needed and desirable to: facilitate the orderly development, management, and conservation of water resources and preparation for and response to drought conditions in order that sufficient water will be available at a reasonable cost to ensure public health, safety, and welfare; further economic development; and protect the agricultural and natural resources of the state and regional water planning area. The regional water planning group may develop information as to the potential impact once proposed changes in law are enacted."

The guidelines also call for regional water planning groups to make recommendations on the designation of ecologically unique river and stream sites and unique sites for reservoir construction. This section presents the regulatory, administrative, legislative, and other recommendations of the Region C Water Planning Group and the reasons for the recommendations. The recommendations are presented in the following order:

- Summary of recommendations
- Recommendations related to the Senate Bill One planning process
- Recommendations related to TNRCC policy and water rights
- Recommendations for state and federal programs to address water supply issues
- Recommendations for ecologically unique river and stream segments
- Recommendations for unique sites for reservoir development

6.1 Summary of Recommendations

The Region C Water Planning Group makes the following recommendations:

- Recommendations related to the Senate Bill One planning process
    - Allow alternative strategies to be designated for near and long term planning needs.

- Encourage TWDB to exercise discretion in the consideration and approval of funding for alternatives not presented as part of the regional water plan.
- Encourage TNRCC to exercise discretion in the consideration and approval of water right permit applications not part of the regional water plan.
- Allow regional water planning groups to assume that contracts for water supply will be renewed when they expire.
- Provide clarification of the impacts of designating a unique stream segment.

- Recommendations related to TNRCC policy and water rights
  - Make certain water rights exempt from cancellation for ten years of non-use.
  - Reduce the regulatory and legislative obstacles to indirect reuse of treated wastewater.
  - Remove barriers to interbasin transfers of water.
- Recommendations for state and federal programs to address water supply issues
  - Increase funding for Texas Water Development Board loans and the state participation program to assist with the development of water supply projects.
  - Accelerate studies of groundwater availability for the Trinity aquifer in North Texas.
  - Increase state participation in water conservation efforts.
  - Provide a program for education of board members of Water Supply Corporations, Special Utility Districts, and Municipal Utility Districts.
  - Increase state participation in watershed protection planning.
  - Encourage federal funding for development, maintenance, and upgrading of NRCS structures.
  - Provide state assistance with maintenance and construction of stock ponds.
  - Encourage Texas Department of Agriculture to include water supply questions on its survey of farmers and ranchers.
- Recommendations for ecologically unique river and stream segments
  - Provide clarification of the impacts of designating a unique stream segment.
- Recommendations for unique sites for reservoir construction
  - Marvin Nichols I
  - Lower Bois d'Arc Creek
  - Muenster

- Tehuacana

These recommendations are discussed in greater detail below.

6.2 Recommendations Related to the Senate Bill One Planning Process

Alternative Strategies for Near and Long Term Needs

Section 357.7(a)(8) of the TWDB Regional Water Planning guidelines requires "specific recommendations of water management strategies to meet near term needs…". As we understand the TWDB interpretation of this requirement:

- Needs through 2030 are near-term needs.
- Listing of a number of alternative strategies among which a water supplier can choose is not allowed for near-term needs.

This requirement decreases the local control and flexibility that have been an important part of the successful efforts to meet water needs in Region C and throughout Texas. Water suppliers need to have a full range of options as they seek to provide new water supplies for Texas' future. It is impossible to foresee all the possibilities for new water supplies in a planning process such as this, and changing circumstances can change the preferred alternative for new supplies very quickly. New laws, court decisions, regulatory changes, permitting decisions, changes in growth patterns, and other factors may make a recommended strategy impossible and require a supplier to develop other alternatives. Limiting the options of water suppliers will make negotiations to obtain needed land or water more difficult and drive up the cost of new water supplies. The following steps should be taken to address these concerns:

- Willing buyer/willing seller transactions of water rights and treated water should not be controlled by this regulation. Such transactions may be beneficial to all concerned and may simply not have been foreseen in the planning process.
- The TWDB and the Texas Natural Resource Conservation Commission (TNRCC) should interpret existing legislation to give the maximum possible flexibility to water suppliers as they seek to serve the public and provide new supplies. Changes in the timing of supply development, the order in which strategies are implemented, the amount of supply from a management strategy, or the details of a project should <u>not</u> be interpreted as making that project inconsistent with the regional plan.

- The TWDB and TNRCC should make liberal use of their ability to waive consistency requirements if local water suppliers elect strategies that differ from those in the regional plan.
- Legislative and regulatory changes should be made to allow plans to present alternative sources of supply where appropriate.

Requirement that a Project Must Be Consistent with the Regional Water Plan to Receive Funding from TWDB

The Senate Bill One legislation requires that a project must be consistent with an approved regional plan in order to receive funding from TWDB. The TWDB has changed its rules to reflect this legislative mandate.

This requirement raises many of the concerns cited above in the discussion of alternative strategies for near and long term needs:

- It decreases local control and flexibility.
- It deprives water suppliers of options.
- It deprives TWDB in flexibility in funding desirable and needed projects.
- Plans must change over time because it is impossible to foresee changing circumstances.
- Limiting the options of water suppliers will make negotiations to obtain needed land or water supplies more difficult and drive up the price of water.

The following steps should be taken to address these concerns:

- Willing buyer/willing seller transactions of water rights and treated water should not be controlled by this regulation. Such transactions may be beneficial to all concerned and may simply not have been foreseen in the planning process.
- The TWDB should interpret existing legislation to give the maximum possible flexibility to water suppliers as they seek to serve the public and provide new supplies. Changes in the timing of supply development, the order in which strategies are implemented, the amount of supply from a management strategy, or the details of a project should <u>not</u> be interpreted as making that project inconsistent with the regional plan.
- The TWDB should make liberal use of its ability to waive consistency requirements where local water suppliers elect strategies that differ from those in the regional plan.
- Legislative and regulatory changes should be made to allow the TWDB to exercise discretion in the consideration and approval of funding for alternatives not presented as part of the regional water plan.

Requirement that a Project Must Be Consistent with the Regional Water Plan to Receive a Water Right Permit from TNRCC

The Senate Bill One legislation requires that a project must be consistent with an approved regional plan in order to receive a water right permit from TNRCC. The TNRCC has adopted rules to reflect this legislative mandate. Section 297.41(a)(3)(E) of TNRCC regulations indicates that "(a) Except as otherwise provided by this chapter, the commission shall grant an application for a water right only if…(3) the proposed application…(E) addresses a water supply need in a way that is consistent with the state water plan and an approved regional water plan for any area in which the proposed appropriation is located, unless the commission determines that new, changed, or unaccounted for conditions warrant waiver of this requirement…." Section 297.41(b) further indicates that the commission shall not issue a municipal water right after September 1, 2001, in any region that does not have an approved regional water plan unless the commission waives the requirement.

This requirement raises many of the same concerns cited in the two discussions above:

- It decreases local control and flexibility
- It deprives water suppliers of options.
- It limits TNRCC's ability to permit the best alternative to meet water supply needs.
- Plans must change over time because it is impossible to foresee changing circumstances.
- Limiting the options of water suppliers will make negotiations to obtain needed land or water supplies more difficult and drive up the price of water.

The following steps should be taken to address these concerns:

- Willing buyer/willing seller transactions of water rights and treated water should not be controlled by this regulation. Such transactions may be beneficial to all concerned and may simply not have been foreseen in the planning process.
- The TNRCC should interpret existing legislation and regulations to give the maximum possible flexibility to water suppliers as they seek to serve the public and provide new supplies. Changes in the timing of supply development, the order in which strategies are implemented, the amount of supply from a

management strategy, or the details of a project should not be interpreted as making that project inconsistent with the regional plan.

- The TNRCC should make liberal use of its ability to waive consistency requirements where local water suppliers elect strategies that differ from those in the regional plan.
- Legislative and regulatory changes should be made to allow TNRCC to exercise discretion in the consideration and approval of water right permit applications not part of the regional water plan.

TWDB Regulations Regarding the Treatment of Contract Expiration in Senate Bill One Planning

TWDB has interpreted its current regulations to require regional water planning groups to assume that water will not be made available from one entity to another after the expiration of current contracts. A water management strategy to renew the contract is required to make the water available after the expiration of the current agreement. If the buyer and seller of the water currently plan to renew their commitment (which they usually do), this requirement forces Senate Bill One planning to be unrealistic and to depart from other planning conducted by water providers. The future supplies available to purchasers of water are underestimated, and the future commitments of those providing the water are also underestimated.

The TWDB should change its regulations to allow regional water planning groups to assume that current contracts will be extended beyond the current expiration date if that reflects the current intention of both parties to the contract.

Clarification of Impacts of Designating a Stream Segment as a Unique Stream Segment

As part of the Senate Bill One planning process, regional water planning groups are asked to make recommendations for designation of unique stream segments. It is difficult to make such recommendations because of the uncertain implications of designation of unique stream segments. The legislature should clarify the intent and impact of the unique stream segment designation. Specific questions that should be answered include the following:

- What is the objective of designating a unique stream segment?
- How would adjacent private properties be affected by the designation?

- How will future water rights be affected? For example, would instream flow requirements be imposed on future water rights upstream?
- How will designation affect regulatory programs to protect water quality?
- What types of activities would be restricted as a result of the designation?
    - Reservoirs on the segment
    - Reservoirs upstream from the segment
    - Wastewater treatment plant discharge permits
    - Power lines
    - Municipal separate storm sewer system permits
    - Pipelines
    - Roads
    - Bridges across the segment
    - Landfills
    - Septic systems
    - Other activities
- What area is affected by the designation? The stream? The entire watershed? An area surrounding the stream?
- Can the designation be reversed?

6.3 Recommendations Related to TNRCC Policy and Water Rights

Cancellation of Water Rights for Non-Use

The Texas Water Code currently allows TNRCC to cancel any water right, in whole or in part, for ten consecutive years of non-use. This rule inhibits long-term water supply planning and is particularly undesirable in the case of major reservoirs constructed for municipal water supply. In order to take full advantage of the yield available at a given site, reservoirs are often constructed to meet needs far into the future. In many cases, only part of the supply is used in the first ten years, with the remainder allocated to meeting future growth.

This should be addressed by changing the water code to exempt certain projects from cancellation for ten years of non-use. The exemption might extend to:

- Municipal water rights

- Water rights for steam electric power generation
- Water rights associated with major reservoirs
- Water rights included as long-term supplies in an approved regional water plan.

Policies Limiting Indirect Reuse of Treated Wastewater

The TNRCC has recently implemented policies, some in response to legislative requirements in Senate Bill One, that limit TNRCC's ability to permit projects for indirect reuse, in which water is returned to a reservoir or watercourse before being rediverted for reuse. The policy of discouraging indirect reuse has a number of negative impacts on water suppliers in Region C and throughout the state:

- The policies are logically inconsistent with policies encouraging direct reuse of treated wastewater.
- The policies inhibit reuse for municipal purposes by prohibiting the most effective approach to municipal reuse, which incorporates "multiple barriers" between wastewater discharge and eventual reuse. Streams and reservoirs are among the most effective of such multiple barriers.
- The policies encourage reuse for irrigation and industrial purposes, where direct reuse is appropriate, while discouraging reuse to meet municipal needs, where indirect reuse is a preferred approach.
- It is poor public policy to discourage indirect reuse, which is a water supply alternative with relatively low environmental impacts.
- It is poor public policy to require the construction of infrastructure for direct reuse in cases when natural watercourses can deliver water much more economically.
- Indirect reuse of treated wastewater is an important element of water supply planning in Region C. In many cases, it provides new water supplies with significantly less environmental impact than would alternative sources, such as new reservoirs.

The legislature should revisit the issue of indirect reuse of treated wastewater using the bed and banks of state watercourses, with a view to reducing the obstacles to indirect reuse. In particular, reuse of water that originates from interbasin transfers should be regarded as developed water and regulated under Section 11.042 of the water code, which currently applies only to reuse of water that originated as groundwater. The historical discharge of treated wastewater effluent should not make the indirect reuse of wastewater more difficult.

Requirements for Interbasin Transfers Introduced in Senate Bill One

Senate Bill One introduced a number of new requirements for applications for water right permits to allow interbasin transfers. The requirements are in Section 11.085 of the water code, and they include many provisions not required for any other type of water right. Requirements imposed on interbasin transfers and not on any other water right include the following:

- Analysis of the impact of the transfers on user rates by class of ratepayer
- Public meetings in the basin of origin and the receiving basin
- Extra notice to county judges, mayors, and groundwater districts in the basin of origin
- Extra notice to legislators in the basin of origin and the receiving basin
- TNRCC request for comments from each county judge in the basin of origin
- Proposed mitigation to the basin of origin
- Demonstration that the applicant has prepared plans that will result in the "highest practicable water conservation and efficiency achievable…"

Exceptions to these extra requirements placed on interbasin transfers were made for emergency transfers, small transfers (less than 3,000 acre-feet under one water right), transfers to an adjoining coastal basin, transfers to a county partially in the basin of origin, and transfers to a municipality whose retail service area is partially within the basin of origin.

The effect of these changes is to make obtaining a permit for interbasin transfer significantly more difficult than it was under prior law and thus to discourage the use of interbasin transfers for water supply. This is undesirable for several reasons:

- Current supplies greatly exceed projected demands in some basins, and the supplies already developed in those basins can only be used by interbasin transfers.
- Interbasin transfers have been used extensively in Texas and are an important part of the state's current water supply. For example, current permits allow interbasin transfers of over 600,000 acre-feet per year from the Red, Sulphur, Sabine, and Neches Basins to meet needs in the Trinity Basin in Region C. This represents almost 1/3 of the region's reliable water supply.
- Emerging Senate Bill One water supply plans for major metropolitan areas in Texas (Dallas-Fort Worth, Houston, and San Antonio) rely on interbasin transfers

as a key component of their plans. It is difficult to envision developing a water supply plan for these areas without significant new interbasin transfers.

- Texas water law has always regarded surface water as belonging to the people of the state, to be used for the benefit of the state as a whole. It is important that the law on interbasin transfers reflect this basic approach.
- The current requirements for permitting interbasin transfers provide an unnecessary barrier to development of the best, most economical, and most environmentally acceptable water supplies.
- Since no interbasin transfer permits have been granted under these new requirements, the meaning of some of the provisions and the way in which they will be applied by TNRCC are undefined.

The legislature should revisit the current law on interbasin transfers and remove some of the unnecessary and counterproductive barriers to such transfers that now exist.

6.4 Recommendations for State and Federal Programs to Address Water Supply Issues

Increased State Funding for Texas Water Development Board Loans and the State Participation Program

The Senate Bill One regional water planning studies are showing significant needs for new water supply projects to allow Texas to grow and prosper. The loan and state participation programs of the Texas Water Development Board have been important tools in the development of existing supplies. These programs need to be continued and extended with additional funding to assist with the development of the next generation of projects as the state seeks to implement the Senate Bill One regional plans.

Studies of Groundwater Availability

The TWDB is currently conducting a series of studies of groundwater availability for major aquifers in Texas. Studies of the Trinity aquifer in North-Central Texas, a major source of water for Region C, are currently scheduled for 2004. For several Region C counties, the current use from the Trinity aquifer is much greater than the available reliable supply from the aquifer, as previously estimated by the TWDB. This would indicate that alternative sources of supply should be developed quickly in those counties. However, in at least some of the counties with substantial overdrafts from the aquifer,

water suppliers are not encountering significant water supply problems and are reluctant to invest in alternative supplies. It is important that updated water availability estimates be developed as soon as possible to help determine whether development of expensive alternative sources of supply is justified.

TWDB should continue its program of developing new groundwater availability models for major aquifers in Texas. If possible, TWDB should accelerate development of the model and of new availability estimates for the Trinity aquifer in North Texas.

Increased State Participation in Water Conservation Efforts

The current TWDB-approved projections of water demand assume significant reductions in per capita municipal use and industrial and irrigation use due to water conservation measures. In Region C, the projected reductions in per capita use result in a 15 percent reduction in projected municipal water use as of 2050. A major portion of that reduction is projected to come from the requirements for low-flow plumbing fixtures in current state and federal law. However, there are other factors tending to increase per capita use in Region C and elsewhere (smaller household size, development of new housing with large lots in many cities, increasing prosperity). It is important that programs be developed to help local water suppliers achieve the conservation savings included in the current water demand projections.

The legislature should provide funding to allow TWDB and other state agencies to undertake or expand the following programs:

- A study of the effectiveness of municipal water conservation programs in Texas and how state agencies can assist local suppliers in achieving conservation goals.
    - What are the trends in per capita use in the state, in various regions, and for various suppliers, after adjusting for climate?
    - Where has conservation been particularly effective?
    - What are the elements of effective programs, and how might they be applied elsewhere in the state?
    - What other factors besides conservation programs affect per capita municipal use (positively or negatively)?
    - Are conservation-oriented water rates effective? If so, how might they be implemented?

- How can state agencies most effectively assist water suppliers in implementing conservation programs?

- Similar studies of the effectiveness of conservation in industrial and irrigation water use and how state agencies can assist in achieving conservation goals.
- State funding for educational programs on water conservation in the schools (such as the Major Rivers program and others).
- State funding for seminars on water conservation and conservation issues to educate policy makers, including elected officials, community leaders, board members of water supply entities, and water utility managers.

Development of a Program to Educate Board Members of Water Supply Entities

The state should develop a program for the education of board members of Water Supply Corporations, Special Utility Districts, and Municipal Utility Districts on water supply issues. The program could include seminars on various issues offered across the state, perhaps in conjunction with the Texas Rural Water Association and other groups. It may be appropriate to consider requirements for accreditation of board members to ensure that they understand water supply issues so that they can govern appropriately.

Increased State Participation in Watershed Protection

One key element of water supply planning is the protection of the quality and usability of supplies we have already developed. The state should develop a program to encourage the development and implementation of watershed protection plans for existing supplies by the owners of the supplies. Elements of such a program could include:

- State grants or matching funding for studies.
- Development of guidance in the development and implementation of watershed protection plans.
- Technical assistance with the development and implementation of watershed protection plans.
- Seminars on watershed protection.
- Development of statewide databases of information that might be useful in watershed protection plans in a standard and consistent format. Such information might include:

- Land use
- Water quality data
- Roads
- Petroleum product pipelines
- Oil and gas wells
- Landfills
- Superfund sites and other potential sources of pollution
- Permitted wastewater discharges

Funding for NRCS Structures

Over the past 50 years, the U.S. Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) has built a great many small dams for sediment control and flood control in Texas. The NRCS reservoirs also provide water for livestock and increase streamflows during low flow periods. The design life for the majority of the NRCS watershed dams is 50 years. Most of the projects were built in the 1950s and 1960s and are nearing the end of their design life. Many of the NRCS structures are in need of maintenance or repair in order to extend the life of the dams. There is legislation under consideration in the U.S. Congress to provide federal funding for renovating and upgrading NRCS flood control structures. The Region C Water Planning Group recommends that the State of Texas seek federal funding to improve and maintain NRCS structures.

In addition, there are some watersheds where local agencies can work with NRCS to develop additional sediment and flood control structures and implement other measures to control erosion. For example, the Tarrant Regional Water District is working with the NRCS to establish erosion control structures in the West Fork watershed. The West Fork Watershed Committee has worked to re-activate the NRCS watershed management program and to secure funding for the project. The state of Texas should seek to extend existing NRCS programs to assist with the development of erosion and sediment control programs.

Maintenance and Construction of Stock Ponds

The dry conditions of recent years have resulted in localized shortages of water for livestock across the state. One way to address these shortages is to develop stock ponds to capture runoff and hold it to provide water in dry periods. The costs of maintaining and building stock ponds can be quite high. State assistance and funding should be made available to help build and maintain stock ponds eligible for agricultural exemption status. Funding for building, improving, dredging, and increasing capacities of stock ponds can help ensure sufficient water supply for livestock.

Survey on Agricultural Water Use

The Texas Agricultural Statistics Service sends out a survey to farmers and ranchers across Texas. Currently, no questions regarding water supply are asked in this survey. Questions could be added to the survey to help quantify the amount of water being used for livestock and irrigation and to identify needed water supply improvements. Potential questions include:

- Do you use groundwater or surface water for your ranch/farm?
- If you are using groundwater:
    - What aquifer(s) are you pumping?
    - What is your total pumping capacity?
    - How deep are your water wells?
- If you are using surface water:
    - How many stock tanks do you have?
    - What is the capacity of each stock tank?
- Are you currently experiencing water shortages?
- How many head of livestock are you watering?
- How many acres of each crop are you irrigating?

Including questions on water supply in the Texas Agricultural Statistics Service survey could improve the basic data available on water use for agriculture and help with future water supply planning.

6.5 Recommendations for Ecologically Unique River and Stream Segments

As part of the Senate Bill One planning process, regional water planning groups are asked to make recommendations for designation of unique stream segments. The Texas Parks and Wildlife Department (TPWD) recommended certain specific stream segments in Region C for designation as unique stream segments. Table 6.1 lists segments recommended by TPWD in *Ecologically Significant River and Stream Segments of Region C, Regional Water Planning Area*[73] .That report included information intended to support designation of the recommended segments. TPWD also submitted a list of other segments recommended for designation with limited supporting information[74]. Those segments are listed in Table 6.2.

The Region C Water Planning Group recommends against designation of any unique stream segments in Region C because of the uncertain implications of such designation. The legislature should clarify the intent and impact of the unique stream segment designation. Specific questions that should be addressed by the legislature are outlined in Section 6.2 above.

6.6 Recommendations for Unique Sites for Reservoir Construction

Section 357.9 of the Texas Water Development Board (TWDB) regional water planning guidelines [1] allows a regional water planning group to recommend unique sites for reservoir construction:

> **"357.9. Unique Sites for Reservoir Construction.** A regional water planning group may recommend sites of unique value for construction of reservoirs by including descriptions of the sites, reasons for the unique designation and expected beneficiaries of the water supply to be developed at the site. The following criteria shall be used to determine if a site is unique for reservoir construction:
>
> (1) site-specific reservoir development is recommended as a specific water management strategy or in an alternative long-term scenario in an adopted regional water plan; or

Table 6.1

Texas Parks and Wildlife Department Recommendations for Designation as Ecologically Unique River and Stream Segments from *Ecologically Significant River and Stream Segments of Region C, Regional Water Planning Area*[73]

				TPWD Reasons for Designation[a]				
River or Stream Segment	**Description**	**Basin**	**County**	**Biological Function**	**Hydrologic Function**	**Riparian Conservation Area**	**High Water Quality/Aesthetic Value**	**Endangered Species/ Unique Communities**
Bois d'Arc Creek	Entire length	Red	Fannin	X	X	X		
Brazos River	Parker/Palo Pinto county line to F.M. 2580	Brazos	Parker	X			X	X
Buffalo/Linn Creek	Vicinity of confluence	Trinity	Freestone	X	X			
Clear Creek	Denton/ Cooke county line to confluence with Elm Fork Trinity River	Trinity	Denton				X	
Coffee Mill Creek	Entire length	Red	Fannin			X		
Elm Fork Trinity River (Denton County)	Lake Ray Roberts to U.S. 380	Trinity	Denton			X	X	
Elm Fork Trinity River (Dallas County)	California Crossing Road to confluence with West Fork Trinity River	Trinity	Dallas			X	X	
Lost Creek	Entire length	Trinity	Jack			X	X	
Purtis Creek[b]	Upstream from Henderson county line	Trinity	Henderson			X		
Trinity River	MacArthur Boulevard to Interstate 45	Trinity	Dallas			X	X	

[a] The criteria listed are from Texas Administration Code Section 357.8. The Texas Parks and Wildlife feels that their recommended reaches meet the criteria marked with an X.

[b] The reach of Purtis Creek recommended for designation by TPWD is in Region D rather than Region C.

Table 6.2

Other Texas Parks and Wildlife Department Suggestions for Designation as Ecologically Unique River and Stream Segments

River or Stream Segment	Basin	County
Red River - Fannin County	Red	Fannin
Red River - Grayson County	Red	Grayson
Red River - Cooke County	Red	Cooke
North Fish Creek	Red	Cooke
South Fish Creek	Red	Cooke
North Sulphur River	Sulphur	Fannin
Beans Creek	Trinity	Jack
Big Creek	Trinity	Wise
Red Oak Creek	Trinity	Ellis
Rowlett Creek	Trinity	Collin

(2) the location, hydrologic, geologic, topographic, water availability, water quality, environmental, cultural, and current development characteristics, or other pertinent factors make the site uniquely suited for :

(A) reservoir development to provide water supply for the current planning period; or

(B) where it might reasonably be needed to meet needs beyond the 50-year planning period."

This section presents the Region C Water Planning Group's recommendations for unique sites for reservoir development and the reasons for the recommendations. The Region C Water Planning Group recommends designation of the following four unique sites for reservoir development:

- Marvin Nichols I site on the Sulphur River in Red River, Bowie, Titus, and Franklin Counties
- Lower Bois d'Arc Creek (New Bonham) site on Bois d'Arc Creek in Fannin County
- Muenster site on Brushy Elm Creek in Cooke County
- Tehuacana site on Tehuacana Creek in Freestone County.

These sites and the reasons for designating them as unique reservoir sites are discussed below.

Marvin Nichols I

Description of the Site. The Marvin Nichols I site is located on the Sulphur River upstream from its confluence with White Oak Creek. The dam would be in Titus, Red River, and Bowie Counties, and the reservoir would also impound water in Franklin County. The proposed reservoir has been studied in the past and was included in the most recent Texas Water Plan as a source of water supply for Region C and Region D. The reservoir has been studied with a conservation pool elevation of 312.0, although a reservoir could be built at this location with conservation storage as high as 320.0.

With the top of conservation storage at elevation 312.0, the proposed reservoir would have a yield of 619,100 acre-feet per year and would flood 62,100 acres. The reservoir has a very large yield compared with other potential projects. The most significant environmental impact of the Marvin Nichols I project would be the inundation of habitat, including wetlands and bottomland hardwoods. The lake would inundate a portion of the Sulphur River Bottom West/Cuckoo Pond bottomland hardwoods area, which is designated as a Priority 1 area in the 1984 U.S. Fish and Wildlife Service *Bottomland Hardwood Protection Plan* [65]. (A Priority 1 area is an "excellent quality bottomlands of high value to the key waterfowl species.") There are also lignite deposits and some oil and gas wells in the pool area of the lake.

Reasons for Unique Designation. Marvin Nichols I would provide a substantial portion of the projected water needs of Region C and Region D. It is included in the Region C water plan as a source of water for all of the major water providers in the region. North Texas Municipal Water District, Dallas Water Utilities, and Tarrant Regional Water District would participate in the project directly, with Fort Worth and the Trinity River Authority acquiring water from Tarrant Regional Water District. Through those major water providers, the reservoir would supply many of the water user groups in Region C.

Compared to the alternative of developing a number of other reservoirs in the Sulphur Basin (George Parkhouse I, George Parkhouse II, and Marvin Nichols II), Marvin Nichols I provides more water at a lower cost and with less environmental impact. The location, geologic, hydrologic, topographic, water availability, water quality, and current

development characteristics make this site uniquely suited to provide a major water supply for Regions C and D.

Expected Beneficiaries of Water Supply. The expected beneficiaries of this project in Region C include the following water providers and water user groups:

- *Dallas Water Utilities and its customers*
    - *Multi-County* - Dallas, Carrollton, Cedar Hill, Combine, Glenn Heights, Grand Prairie, Grapevine, Lewisville, Ovilla
    - *Dallas County* - Addison, Balch Springs, Cockrell Hill, Coppell, De Soto, Duncanville, Farmers Branch, Hutchins, Irving, Lancaster, Seagoville, Wilmer, Dallas County Other, Dallas County Manufacturing, Dallas County Steam Electric Power, Dallas County Mining
    - *Denton County* - Denton, Flower Mound, The Colony, Denton County Other, Denton County Manufacturing
    - *Ellis County* - Oak Leaf
    - *Upper Trinity Water District and its current and potential customers*
        - *Multi-County* - Lewisville (also directly from Dallas)
        - *Collin County* - Celina, Prosper
        - *Cooke County* - Valley View, Cooke County Other
        - *Denton County* - Argyle, Aubrey, Bartonville, Copper Canyon, Corinth, Crossroads, Double Oak, Flower Mound (also directly from Dallas), Hebron, Hickory Creek, Highland Village, Justin, Krugerville, Krum, Lake Dallas, Lincoln Park, Northlake, Oak Point, Pilot Point, Ponder, Sanger, Shady Shores, Denton County Other (also directly from Dallas), Denton County Manufacturing (also directly from Dallas)
- *North Texas Municipal Water District and its customers*
    - *Multi-County* - Frisco, Garland, Plano, Richardson, Rowlett, Royse City, Sachse, Wylie
    - *Collin County* - Allen, Fairview, Farmersville, Lucas, McKinney, Melissa, Murphy, New Hope, Parker, Princeton, Prosper (also from UTRWD), Collin County Other, Collin County Manufacturing, Collin County Steam Electric Power
    - *Dallas County* - Mesquite, Sunnyvale, Dallas County Other (also from Dallas), Dallas County Manufacturing (also from Dallas), Dallas County Steam Electric Power (also from Dallas)
    - *Denton County* - Little Elm

- *Kaufman County* – Crandall, Forney, Kaufman, Oak Grove, Kaufman County Other, Kaufman County Manufacturing
- *Rockwall County* – Heath, Rockwall, Rockwall County Other, Rockwall County Manufacturing

- *Tarrant Regional Water District and its current and potential customers in Tarrant, Denton, Parker, Wise, and Johnson Counties*
  - *Multi-County* – Burleson (part in Region G, through Fort Worth), Mansfield (part in Region G), Azle, Briar, Grapevine (through TRA, also from Dallas), Newark, Grand Prairie (through Fort Worth, also from Dallas), Southlake (through Fort Worth)
  - *Denton County (through Fort Worth)* – Northlake (also from UTRWD), Roanoke, Trophy Club, Denton County Other
  - *Parker County* - Reno, Springtown, Weatherford, Parker County Steam Electric Power
    - *Through Weatherford* – Aledo, Annetta, Hudson Oaks, Willow Park, Parker County Other, Parker County Manufacturing
  - *Tarrant County* – Arlington, Benbrook, Blue Mound, Fort Worth, River Oaks, Tarrant County Irrigation, Tarrant County Mining, Tarrant County Steam Electric Power
    - *Through Fort Worth* – Benbrook (also direct from TRWD), Crowley, Dalworthington Gardens, Edgecliff Village, Everman, Forest Hill, Haltom City, Haslet, Hurst, Keller, Kennedale, Lake Worth Village, North Richland Hills, River Oaks (also direct from TRWD), Pantego, Richland Hills, Saginaw, Sansom Park Village, Watauga, Westworth Village, White Settlement, Tarrant County Other, Tarrant County Manufacturing
    - *Through Trinity River Authority* - Bedford, Colleyville, Euless, North Richland Hills (also through Fort Worth), Watauga (also through Fort Worth), Tarrant County Other (also through Fort Worth), Tarrant County Manufacturing (also through Fort Worth)
    - *Through Arlington* – Kennedale (also through Fort Worth), Pantego (also through Fort Worth)
  - *Wise County* - Aurora, Boyd, Bridgeport, Chico, Decatur, Rhome, Wise County Other, Wise County Manufacturing, Wise County Mining, Wise County Steam Electric Power.

Lower Bois d'Arc Creek (New Bonham)

Description of the Site. Lower Bois d'Arc Creek Reservoir would be located on Bois d'Arc Creek in Fannin County, immediately upstream from the Caddo National

Grassland. The proposed reservoir has been studied in the past with a conservation pool elevation of 534.0, and the Red River Compact gives Texas unlimited use of the waters of Bois d'Arc Creek upstream from the Lower Bois d'Arc Creek site.

With the top of conservation storage at elevation 534.0, the proposed reservoir would have a yield of 123,000 acre-feet per year and would flood 16,400 acres. The most significant environmental impacts of Lower Bois d'Arc Creek Reservoir would be the inundation of habitat, including wetlands and bottomland hardwoods. The lake would inundate the Bois d'Arc Creek bottomland hardwoods area, which is designated as a Priority 4 area in the 1984 U.S. Fish and Wildlife Service *Bottomland Hardwood Protection Plan* [65]. (A Priority 4 area is a "moderate quality bottomlands with minor waterfowl benefits.") The lake would have no direct impacts on the Caddo National Grasslands, but changes in flow patterns on Bois d'Arc Creek could have an indirect impact on the grasslands. In order to protect the grasslands, the Texas Parks and Wildlife Department nominated Bois d'Arc Creek for designation as an ecologically unique stream segment. Meeting the release requirements from the Texas Water Development Board consensus criteria for releases would minimize the downstream impacts of Lower Bois d'Arc Creek Reservoir.

Reasons for Unique Designation. The North Texas Municipal Water District would be the primary developer of the Lower Bois d'Arc Creek Reservoir, and it is assumed that the District would use 80 percent of the yield of the project. The remaining 20 percent of the yield would be reserved for use in the Red River Basin in the area of the project, particularly Fannin County. The North Texas Municipal Water District needs a major new supply by 2020, approximately 10 years earlier than the other major water providers in Region C. Because Lower Bois d'Arc Creek is smaller, costs less, and has less environmental impact than Marvin Nichols I, it could be developed by NTMWD alone and developed more quickly than the larger reservoir. Water in Lower Bois d'Arc Creek Reservoir would be relatively inexpensive in the lake and would also be relatively inexpensive delivered to the North Texas Municipal Water District.

The location, geologic, hydrologic, topographic, water availability, water quality, environmental, and current development characteristics make this site uniquely suited to provide water supply for Region C.

Expected Beneficiaries of Water Supply. The expected beneficiaries of this project include North Texas Municipal Water District and its customers and water user groups in Fannin County:

- *North Texas Municipal Water District and its customers*
    - *Multi-County* - Frisco, Garland, Plano, Richardson, Royse City, Sachse, Wylie, Rowlett
    - *Collin County* - Allen, Fairview, Farmersville, Lucas, McKinney, Melissa, Murphy, New Hope, Parker, Princeton, Prosper, Collin County Other, Collin County Manufacturing, Collin County Steam Electric Power
    - *Dallas County* - Mesquite, Sunnyvale, Dallas County Other (also from Dallas), Dallas County Manufacturing (also from Dallas), Dallas County Steam Electric Power (also from Dallas)
    - *Denton County* – Little Elm
    - *Kaufman County* – Crandall, Forney, Kaufman, Oak Grove, Kaufman County Other, Kaufman County Manufacturing
    - *Rockwall County* – Heath, Rockwall, Rockwall County Other, Rockwall County Manufacturing
- *Water User Groups in Fannin County* – Bonham, Honey Grove, Leonard, Savoy, Trenton, Fannin County Other, Fannin County Manufacturing.

Muenster

Description of the Site. Muenster Reservoir would be located on Brushy Elm Creek in Cooke County. The proposed reservoir has been permitted by the Texas Natural Resource Conservation District for impoundment of 4,700 acre-feet and diversion of 500 acre-feet per year for municipal use. The reservoir would flood 418 acres at the top of conservation storage. Because of its small size, the reservoir would have little environmental impact.

Reasons for Unique Designation. The Muenster Water District and the Natural Resource Conservation Service are developing Muenster Lake for municipal water supply, flood control, and recreation. The project has been permitted by the Texas Natural Resource Conservation Commission and approved by local voters. Muenster Lake would reduce Muenster's dependence on the Trinity aquifer, which is overused in Cooke County.

The location, geologic, hydrologic, topographic, water availability, water quality, environmental, and current development characteristics make this site uniquely suited to provide water supply for Region C.

Expected Beneficiaries of Water Supply. The expected beneficiaries of this project include Muenster, Cooke County Manufacturing, and Cooke County Other. The project would indirectly benefit other water user groups in Cooke County by reducing use from the Trinity aquifer.

Tehuacana

Description of the Site. Tehuacana Reservoir would be located on Tehuacana Creek in Freestone County, south of Richland-Chambers Reservoir. The proposed reservoir was included in the last state water plan as a source of supply for the Tarrant Regional Water District. The project has been part of TRWD's planning for many years, and it fits well with the District's system. The reservoir would have a conservation pool elevation of 315.0, the same as Richland-Chambers, and the two lakes would be connected by a channel.

With the top of conservation storage at elevation 315.0, the proposed reservoir would have a yield of 68,300 acre-feet per year and would flood 14,900 acres. The most significant environmental impacts of Tehuacana Reservoir would be the inundation of habitat, including wetlands and bottomland hardwoods. There are also lignite resources and oil and gas wells in the area that would be inundated by Tehuacana Reservoir.

Reasons for Unique Designation. Tehuacana Reservoir has been in the plans of the Tarrant Regional Water District for decades. The lake would be connected to Richland-Chambers Reservoir by a channel, allowing the water supply provided by Tehuacana to be pumped from Richland-Chambers. Development of Tehuacana could allow extension of the Tarrant Regional Water District project of diversions from the Trinity for additional water supply. Although this reservoir is not recommended for development before 2050 if other sources can be developed, it remains desirable as an alternative project and as a source of supply for growth after 2050.

The location, geologic, hydrologic, topographic, water availability, water quality, and current development characteristics make this site uniquely suited to provide water supply for Region C.

Expected Beneficiaries of Water Supply. The expected beneficiaries of this project would be Tarrant Regional Water District and its existing and potential customers as well as water user groups in Freestone County:

- *Multi-County* – Burleson (part in Region G, through Fort Worth), Mansfield (part in Region G), Azle, Briar, Grand Prairie (through Fort Worth), Grapevine (through TRA), Southlake (through Fort Worth), Mabank, Newark
- *Denton County (through Fort Worth)* – Northlake, Roanoke, Trophy Club, Denton County Other
- *Ellis County (through TRA)* – Ennis, Ferris, Italy, Maypearl, Midlothian, Palmer, Red Oak, Waxahachie, Ellis County Other, Ellis County Manufacturing
- *Freestone County* – Fairfield, Teague, Wortham, Freestone County Other, Freestone County Steam Electric Power
- *Henderson County* – Gun Barrel City, Malakoff, Payne Springs, Seven Points, Tool, Henderson County Other, Henderson County Steam Electric Power
- *Kaufman County* – Kemp, Kaufman County Other, Kaufman County Mining
- *Navarro County* – Corsicana
    - *Through Corsicana* – Blooming Grove, Dawson, Frost, Navarro County Other, Navarro County Manufacturing
- *Parker County* - Reno, Springtown, Weatherford, Parker County Steam Electric Power
    - *Through Weatherford* – Aledo, Annetta, Hudson Oaks, Willow Park, Parker County Other, Parker County Manufacturing
- *Tarrant County* – Arlington, Benbrook, Blue Mound, Fort Worth, River Oaks, Tarrant County Irrigation, Tarrant County Mining, Tarrant County Steam Electric Power
    - *Through Fort Worth* – Benbrook (also directly from TRWD), Crowley, Dalworthington Gardens, Edgecliff Village, Everman, Forest Hill, Haltom City, Haslet, Hurst, Keller, Kennedale, Lake Worth Village, North Richland Hills, Pantego, Richland Hills, River Oaks (also directly from TRWD), Saginaw, Sansom Park Village, Watauga, Westworth Village, White Settlement, Tarrant County Other, Tarrant County Manufacturing
    - *Through Trinity River Authority* - Bedford, Colleyville, Euless, North Richland Hills (also through Fort Worth), Watauga (also through Fort

Worth), Tarrant County Other (also through Fort Worth), Tarrant County Manufacturing (also through Fort Worth)

- *Through Arlington* – Kennedale (also through Fort Worth), Pantego (also through Fort Worth)

- *Wise County* - Aurora, Boyd, Bridgeport, Chico, Decatur, Rhome, Wise County Other, Wise County Manufacturing, Wise County Mining, Wise County Steam Electric Power.