

**APPENDIX E  
TABLE OF CONTENTS**

**I. Issues Affecting Water Planning ..... E-1**  
A. Major Issues..... E-1  
B. Unresolved Issues..... E-2

**II. Region-Wide Shortages and Identified Strategies ..... E-2**  
A. Municipal Shortages..... E-2  
B. Irrigation Shortages In the Southern Counties and the Needs Of Neighboring Regions  
..... E-5  
C. Region-Wide Strategies ..... E-7

**III. Policy Recommendations ..... E-7**  
A. Groundwater Management ..... E-7  
B. Interbasin Transfers of Surface Water ..... E-8  
C. Impacts On Return Flows and Ecological Values ..... E-9  
D. Agricultural Land Preservation and Conservation..... E-9  
E. Agricultural Water Conservation and Brush Control ..... E-9  
F. Sustainability ..... E-10  
G. Relief For Small Systems Affected By New Radionuclides And Uranium Standards . E-10  
H. Recommended Improvements To The Regional Planning Process..... E-10

**IV. Ecologically Unique Stream Segments And Reservoir Sites ..... E-11**  
A. General ..... E-11  
B. Ecologically Unique Stream Segments ..... E-11  
C. Unique Reservoir Sites ..... E-13

**LIST OF TABLES**

Table E- 1. Municipal Water User Groups With Deficits ..... E-3  
Table E- 2. Strategies for Meeting Water Shortages ..... E-4  
Table E- 3. Stream Segments Identified for Further Study ..... E-12  
Table E- 4. Reservoir Sites Identified for Further Study ..... E-13

## APPENDIX E - WATER NEEDS

### I. Issues Affecting Water Planning

#### A. Major Issues

The issues involved in meeting water shortages within the lower Colorado River basin are complex and inter-related. Not all issues could be resolved during the two-year water planning process. The section on policy recommendations later in this summary provides an overview of some of the key concerns, and a listing of unresolved issues related to the specifics of the Regional Plan.

Many issues relate to the impacts of growth within the region and how to maintain a sustainable water supply system in conjunction with protecting the region's diversity of ecological communities and quality of life. Among the most prominent circumstances and concerns addressed by the Lower Colorado River Water Planning Group (LCRWPG) are:

- Addressing needs of both urban growth and agricultural irrigation to maintain a sound and diverse economy and a variety of lifestyles;
- Maintaining lake levels in the Highland Lakes to support recreation and tourism, which are key elements in the region's quality of life and economic health;
- Other regions, particularly the South Central Texas Region, face major water shortages that they may not find feasible means to meet within their own boundaries. Water user groups in the areas surrounding Region K have looked to Region K for water sources to meet their needs;
- Maintaining the instream flows required for a healthy river and rich biological diversity in the bays and estuaries of the Gulf of Mexico that rely on inflows of fresh water;
- How to both respect the autonomy and local control of individual water user groups (Senate Bill 1 specifically prohibits the Regional Water Planning Groups from imposing "solutions" on individual user groups) and at the same time foster broad programs of conservation, drought management, and conjunctive use that are key elements to water management in much of the region;
- How to address water strategies (such as brush control) that cross the boundaries between public and private property, individual and community benefits, and many political jurisdictions;
- The impacts of decisions such as designation of sites for preservation or development (e.g., ecologically unique stream segments) on private property rights and the ability of cities and counties to maintain their tax base; and,
- The unintended consequences of many water strategies, such as the impacts on downstream users of upstream reservoirs and widespread dewatering of aquifers.

## **B. Unresolved Issues**

Although many aspects of the issues listed above continue to be debated and require additional refinement, the LCRWPG identified specific unresolved issues that will affect implementation of the proposed plan and will require the attention of future Regional Water Planning Groups.

Among the most prominent unresolved issues are those related to the uncertainties inherent in groundwater modeling and the limited data available regarding the region's aquifers and groundwater hydrology. This affects discussion of the water availability in the Carrizo-Wilcox aquifer, for example, which is a vital part of the strategy recommended in this Plan. In some cases, dewatering could occur across regional boundaries. The LCRWPG will continue to take an active interest in groundwater modeling efforts and other studies to better characterize the region's hydrology. In concurrence with other regions, Region K urges the TWDB to continue funding these types of studies, which are vital to the planning process.

Return flows from the City of Austin are a second area where estimating far into the future has caused uncertainty. The degree to which Austin will recycle its wastewater effluent is in part dependent on the degree to which shortages occur once the 325,000 acre-feet of water the City has provided for is fully used. The City has the right to recycle all its wastewater, but the Plan as submitted assumes a substantial amount of return flow. The planning group's approved estimates indicate that by the year 2050, Austin may be reusing approximately 31,000 ac-ft/yr (~ 16%) of its effluent and this amount is projected to increase beyond 2050.

The full impact on bays and estuaries of the combined strategies will continue to be a difficult issue to resolve. Studies are now under way regarding how the capture of water in the proposed southern-county off-channel reservoirs would affect bays and estuaries. The contribution of rice flood-culture irrigation is not well understood at present. Further study is needed to quantify stormwater runoff from open fields, irrigation water drained from field and irrigation system leakage.

Senate Bill 1 assumes effective conservation programs in municipalities throughout all regions, yet many cities have not taken effective measures to achieve conservation goals. In addition, the plan proposed for Region K depends heavily on advanced farm conservation improvements, with the assumption that long-term water leases to customers outside the region can fund these improvements. If such leases do not materialize, or if the revenue is inadequate for full implementation, the goals of the plan may not be achieved.

## **II. Region-Wide Shortages and Identified Strategies**

### **A. Municipal Shortages**

Table E-1 lists current and projected future water supply deficits for municipal water user groups within the lower Colorado River basin.

**Table E- 1. Municipal Water User Groups With Deficits**

WUG	County	Provider	2000 (ac-ft/yr)	2030 (ac-ft/yr)	2050 (ac-ft/yr)
Cottonwood Shores	Burnet	LCRA	-3	-168	-171
Granite Shoals	Burnet	LCRA	0	-456	-493
Marble Falls	Burnet	LCRA	0	-2,105	-2,264
County-Other	Burnet	LCRA	-880	-1,652	-1,779
County-Other	Llano	LCRA	0	-1,334	-1,653
Kingsland	Llano	LCRA	-25	-463	-493
Manufacturing	Matagorda	LCRA	1,709	-30,035	-31,019
Steam Electric	Matagorda	LCRA	0	0	-5,237
Mining	Matagorda	LCRA	-4,475	-6,249	-6,285
Anderson Mill <sup>2</sup>	Travis	City of Austin	0	-33	-34
Jonestown	Travis	LCRA	0	-40	-485
Lago Vista	Travis	LCRA	0	-2,995	-3,630
Lakeway	Travis	LCRA	0	-2,693	-3,287
Pflugerville <sup>3</sup>	Travis	City of Austin	-291	-2,323	-3,378
Rollingwood <sup>1</sup>	Travis	City of Austin	0	-675	-793
Wells Branch	Travis	City of Austin	0	-1,013	-1,064
West Lake Hills	Travis	City of Austin	0	-2,956	-3,682
County-Other	Travis	LCRA / COA	-60	-7,438	-8,797
Anderson Mill <sup>2</sup>	Williamson	City of Austin	0	-1,986	-2,106
County-Other	Williamson	City of Austin	-72	-178	-215
Regional Deficit			-7,515	-64,792	-76,865

<sup>1</sup> The City of Austin (COA) recently renewed its contract with Rollingwood for 1,120 ac-ft/yr through February 2030;

<sup>2</sup> The Anderson Mill MUD will become a part of the COA retail service beginning in December 2004, which will be included in the next planning cycle;

<sup>3</sup> Pflugerville is listed above as having water supply deficits during the planning period because they are not planning to utilize the COA contract to meet future needs and are currently evaluating alternate water supply options – this issue should be clarified in the next planning cycle;

Table E-2 provides a list of the methods adopted by the LCRWPG for meeting identified water supply shortages.

**Table E- 2. Strategies for Meeting Water Shortages**

Water User Group	Shortages (ac-ft/yr)	Strategies for Meeting Shortages	Estimated Unit Cost (\$/ac-ft) <sup>1</sup>	Estimated Project Cost (\$ Million) <sup>1</sup>
WUGs w/ expiring LCRA contracts	2050 = 102,034	Renewal of contracts for purchase of raw water from LCRA. ( <i>Alternative C1</i> )	\$105 <sup>(2)</sup>	--
WUGs w/ water expiring COA contracts	2050 = 19,308	Renewal of contracts for purchase of potable water from the City of Austin ( <i>Alternative C2</i> ); and/or Direct use of Colorado River supply.	\$652 <sup>(3)</sup> (b) \$538	-- --
City of Austin	2040 = 1,341 2050 = 30,714	Water conservation -- 10% savings ( <i>Alternative A1</i> ); Reclaimed water--up to 31,000 ac-ft/yr or recycling up to 100% of wastewater flows to meet demand in excess of 325,000 ac-ft/yr ( <i>Alternative A2</i> ).	(a) unknown (b) \$394	-- \$63.210
Hays County-Other	2010 = 162 2030 = 1,892 2050 = 3,594	Through 2030 (pending approval of the local water authorities): Obtain surface water from west Travis County Regional System--up to 3,360 ac-ft ( <i>Alternative H1</i> ); and/or Obtain surface water from GBRA/San Marcos Regional System--up to 1,680 ac-ft ( <i>Alternative H2</i> ); and/or Obtain potable water from the COA--up to 1,100 ac-ft/yr ( <i>Alternative H3</i> ); and, Build recharge-enhancing ponds along Onion Creek--up to 4,000 ac-ft ( <i>Alternative H6</i> ).	\$1,259 \$647 \$818 \$98	\$23.610 \$15.110 \$2.200 \$4.555
City of Dripping Springs	2030 = 22 2050 = 364	Obtain surface water from west Travis County Regional System--up to 3,360 ac-ft ( <i>also part of Alternative H1</i> ); and/or	\$1,259	Same as (a) above Hays County-Other: H1
City of Blanco	2030 = 15 2050 = 5	Purchase potable water from Canyon Lake Water Supply Corporation--up to 300 ac-ft/yr ( <i>Alternative BL6</i> ). (projected reduction from 2030 due to conservation)	\$1,562	\$4.680
Blanco County-Other	2000 = 24 2030 = 163 2050 = 215	Purchase potable water from Canyon Lake Water Supply Corporation--up to 300 ac-ft/yr ( <i>also Alternative BL6</i> ).	\$1,562	Same as above for BL6

**Table E- 2. (continued)**

Water User Group	Shortages (ac-ft/yr)	Strategies for Meeting Shortages	Estimated Unit Cost (\$/ac-ft) 1	Estimated Project Cost (\$ Million) 1
City of Llano	2000 = 660	Constraint is storage capacity Dredge existing reservoirs--# of acre-foot benefit unquantified ( <i>Alternative L1 – annual costs only</i> ); and/or Add a channel dam downstream of existing reservoirs--produces 1,300ac-ft/yr ( <i>Alternative L2</i> ).	\$710	\$0.071/yr
	2030 = 555 2050 = 602		\$461	\$2.530
City of Goldthwaite	2000 = 117	Constraint is storage capacity; reservoir feasibility study in progress. Dredge existing reservoirs--amount unspecified ( <i>Alternative G1</i> ); and/or Build new off-channel reservoir--200 ac-ft ( <i>Alt. G3</i> ); Build new Colorado River channel dam--400 ac-ft ( <i>Alt. G2</i> ); Build new Mills County reservoir--yield unquantified ( <i>Alt. G4</i> ) (Drought management plan adopted in July 2000)	\$1,150	\$0.150
	2030 = 89		\$1,425	\$2.890
	2050 = 88		\$750	\$2.405
Mills County-Other	Not calculated	Build Mills County reservoir--yield unquantified	\$384	Same as (d) above: G4
Gillespie County	2000 = 507	Growth in Fredericksburg area creating shortages Aquifer storage/recovery system--up to 1,120 ac-ft ( <i>Alternative GL1</i> ) Develop new groundwater resources—unquantified ( <i>Alternative GL2 – assumes 180ac-ft/yr</i> )	\$839	\$8.030
	2030 = 677 2050 = 1,013		assumes \$350	assumes \$0.300
Irrigation in Matagorda, Wharton, & Colorado counties	See Sections ES.5.3.1 & ES.5.3.2	See discussion below in Sections ES.5.3.1 & ES.5.3.2	--	--

- (1) Unit Costs and Project Costs obtained from Chapter 5 “Opinion of Probable Costs” tables for each alternative listed above;  
(2) LCRA current water supply contract rate;  
(3) City of Austin current water supply contract rate.

**B. Irrigation Shortages In the Southern Counties and the Needs Of Neighboring Regions**

To address the needs of irrigators in Matagorda, Colorado and Wharton counties, as well as the needs of upstream communities shown in Table E-2 and the needs of the South Central Texas Region (Region L) several ideas were developed by the LCRWPG, which together comprise the recommended strategy. The elements are:

- Advanced farm conservation techniques such as laser-leveling of rice fields, multiple field inlets and reduced levee intervals; additional conservation savings through use of automated water delivery control systems, improvement of canal flow control structures, and flow-regulating storage reservoirs within the irrigation systems. In addition, research is planned to seek out varieties of rice that can be grown successfully with less water and alternative crops. These two measures are projected to save approximately 118,000 acre-feet of water annually within Region K, and any advances in rice varieties could contribute to conservation elsewhere on the Coastal Plain;
- Construction of four off-channel reservoirs at unspecified sites in the southern end of the region within about five miles of the Colorado River to capture river flows appropriated under LCRA irrigation water rights, and unappropriated flood flows in the amount of at least 131,000 acre-feet per year of water for use during critical drought periods. This amount may increase to 150,000 acre-feet or more depending upon permit requirements for these reservoirs, which will be based on LCRA's existing water rights;
- A pipeline beginning in the area of Bay City to carry up to 122,000 acre-feet of water annually to San Antonio under a lease agreement that assures San Antonio a long-term—but not permanent—source of water. The exact amounts and forms of payment required remain open to discussion between the parties, as do many other specifics;
- Mitigation measures focused on preventing harm to the bays and estuaries due to the reduction in freshwater inflow caused by capturing water in the new off-channel reservoirs. Research into what is needed in this regard is in progress;
- Development of new wells within the boundaries of two or more of the southern irrigation districts affected by projected shortages: Lakeside, Gulf Coast, and Pierce Ranch. These wells would supplement other irrigation supplies during periods of severe drought only. This use of groundwater and surface water in combination is called "conjunctive use". Such conjunctive use systems would be staged over time to allow assessment of groundwater impacts. Average annual groundwater use during critical drought would be no more than 68,000 acre-feet per year; and,
- Mitigation measures to remedy any unacceptable impacts on groundwater users due to the development of the new wells mentioned above.

Implementing these strategies also makes it possible to preserve more water upstream in the Highland Lakes during drought periods, thereby preserving their recreational and aesthetic values for a longer period of time.

An additional strategy prompted by needs in Region L is:

- A diversion of Colorado River water from somewhere between Lake Austin and Bastrop, coupled with a pipeline to deliver this water to southern Hays County in Region L, which has identified a shortage. The LCRWPG envisions that this diversion would initially consist of about 5,000 acre-feet per year of water, with the

amount rising as needs increase to an estimated maximum of 9,000 acre-feet per year. The LCRWPG has approved water transfers of up to 28,000 ac-ft/yr in 2050, subject to the supply ultimately determined to be available as a result of developing the four off-channel reservoirs. No final agreement has been reached with the potential purchasers, so no firm dollar amounts or charges are available at the time of this report.

### C. Region-Wide Strategies

The strategies for addressing shortages mentioned above focus on the activities of individual water user groups and jurisdictions and on actions that these entities can undertake through their own initiative. Some water management strategies, while providing major benefits, require broad public cooperation and/or require shifts in the way the public and utilities view water resources. In the Lower Colorado Region, the most important of these strategies (in order of feasibility) are:

- Municipal conservation
- Water reclamation / recycling
- Rainwater harvesting
- Brush management
- Weather modification

## III. Policy Recommendations

### A. Groundwater Management

At present, there are six Groundwater Conservation Districts operating within the Lower Colorado Region, including two provisional Senate Bill 1911 districts. Many potential threats to groundwater sustainability now face the region. The Planning Group identified improved groundwater management as the top priority to be addressed in its policy recommendations.

Where local control is desired, the Planning Group strongly endorses the creation of Groundwater Conservation Districts (GCDs) known as "Chapter 36" GCDs. GCDs are appropriate if there is local support and the need for management of the groundwater resources. The Planning Group recommends that consideration be given to developing multi-county districts or single-county districts with shared management and costs. Priority Groundwater Management Areas in particular should be urged to consider the formation of local GCDs as the preferred method for the management of groundwater resources.

Adjacent hydrological impacts should also be considered consistent with both local control and the objectives of Section 59, Article XVI of the Texas Constitution.

Wherever possible, GCD boundaries should be derived from hydrogeologic boundaries or, where only a single-county GCD is possible, adequate funding and cooperation with neighboring GCDs should be assured. The Planning Group recommends that full "Chapter 36" authority be granted to GCDs created through Senate Bill 1911 of the 76<sup>th</sup> Texas Legislature.

The Planning Group adopted a resolution stating that it opposes the mining of groundwater except during limited periods of extreme drought. The Group recognizes that GCD formation modifies the rule of capture in this regard, and believes that GCDs foster improved stewardship of groundwater resources.

This includes supporting regulation of groundwater transfers from the region by recommending that such permits be granted under guidelines that ensure beneficial and non-wasteful use, prevent unreasonable interference with previously permitted wells, protect natural resources, and require consistency with the district's management plan. The Planning Group supports amending subsections of Texas Water Code Section 36.205 to give districts more leeway and discretion in charging interregional transfer-related fees.

By the same token, the Planning Group recommends the repeal of the well permitting exemptions contained in Texas Water Code Section 36.117 by deleting the exemptions contained in Subsection (a) and the related provisions of Subsections (b) through (h). Thus, the remaining language of Section 36.227 would read: "A district may exempt wells from the requirements to obtain a drilling permit, an operating permit, or any other permit required by this chapter of the district's rules."

The recommended change would allow GCDs to adopt their own permitting exemptions through local rule-making processes. This addresses the problems presented by current exemptions of wells incapable of producing more than 25,000 gallons a day (which is far in excess of the amount needed for domestic use) and wells supplying water for activities regulated by the Texas Railroad Commission, such as for oil and gas exploration or production. The exemptions currently included in law effectively cripple efforts to better manage groundwater in many areas.

The Planning Group also supports conjunctive use of surface water and groundwater to meet the region's water needs. This is particularly cogent as regards State (or even Federal) intervention to mandate minimum spring flows. Endangered species within the Lower Colorado Region, as well as vulnerability to the demands of other regions, presents the potential for loss of highly valued local control. Conjunctive use holds out the promise of finding solutions that protect both the region's aquifers and the environment.

## **B. Interbasin Transfers of Surface Water**

This controversial issue has been the topic of much debate both before and since the passage of Senate Bill 1.

The Planning Group supports the preservation of junior water rights introduced in Senate Bill 1. In addition, however, the Group believes that the junior water rights provision should be amended to clarify its full applicability to water sale contracts as well as to water rights transfers.

With regard to Region K, the Planning Group adopted a resolution stating that—while the sale of 25,000 acre-feet of water by LCRA to Williamson County already authorized by HB1437 will go ahead as planned—future sales in excess of that quantity should

require replacement of at least 1.33 acre-feet of water for each 1.0 acre-foot of water transferred.

### **C. Impacts On Return Flows and Ecological Values**

The Planning Group concluded that because of increasing water reuse, conservation, water marketing, and the potential for large-scale interbasin transfers, there is a need to consider the return-flow aspects of water use in conducting water planning and in evaluating supply strategies. Diminished return flows in some cases could require more releases from LCRA reservoirs for adequate dilution to lower pollutant concentrations and maintain ecological systems.

As regards Region K in particular, the Planning Group recommends that the LCRA release water from storage as necessary to prevent degradation of human and livestock water supplies. These releases should be in amounts sufficient to protect the health of riparian, riverine, estuarine, and hardwood bottomland ecosystems.

### **D. Agricultural Land Preservation and Conservation**

Texas is the most rapidly urbanizing state in the country, and the Lower Colorado Region provides many examples of the advance of urban sprawl across lands that have traditionally been devoted to agricultural production. The Region K Planning Group found that a lack of reliable information about the amount and location of agricultural lands being lost to other uses has hindered the planning process.

The RWPG recommends that a farmland preservation study be undertaken. The Texas Department of Agriculture or the Agricultural Extension Service should:

- Inventory lands now devoted to agriculture;
- Analyze the amount and nature of farmlands lost to urban sprawl;
- Assess the effectiveness of current state programs for preserving farmlands;
- Consider what changes in state law or department efforts might more effectively preserve agricultural lands; and,
- Assess the economic, cultural, water quality and environmental contributions of agriculture.

Water marketing and the uncontrolled use of groundwater are of special concern in this regard. The impacts of these two factors on agriculture and people living in farm communities must be understood to gain a comprehensive view of regional water planning.

### **E. Agricultural Water Conservation and Brush Control**

While water users of all kinds must adopt conservation practices, funding research projects aimed at developing low-water-use varieties of rice has the potential to substantially reduce the amount of water required for the region's agriculture. The LCRWPG recommends that funds be sought for this purpose from state agency research grant programs and contributions from the rice industry, agribusiness, the LCRA, and other interested parties. Note that if a long-term lease of water from the

LCRA to Region L is implemented as recommended, this long-term lease could potentially be used as a funding source.

The LCRWPG also endorses studies of brush control on a voluntary basis, especially in the area west of Interstate Highway 35. In addition, the Planning Group recommends that state and/or federal funds be made available to landowners requesting assistance with brush control efforts.

#### **F. Sustainability**

The LCRWPG supports State action to develop forecasts of each region's growth limits assuming current technology. This forecast should estimate the number of people, industries, and agricultural systems a Regional Water Plan will support, regardless of whether these water user groups reside within or outside of the region's boundaries. The forecast should take into account the need to preserve cultural resources, economic opportunity, farmlands, and rural communities.

#### **G. Relief For Small Systems Affected By New Radionuclides And Uranium Standards**

The U.S. Environmental Protection Agency (USEPA) is planning to issue new drinking water standards for radionuclides and uranium. Small water systems in Region K that use groundwater from the Hickory and Marble Falls aquifers (as well as utilities in Region F) could be severely affected.

The LCRWPG recommends that the State request the USEPA to provide thorough scientific data showing that health risks are indeed present, since there have been no known radiation-related health problems in the communities served by these utilities.

Furthermore, if compliance with the new standards is required, the LCRWPG recommends that the State provide adequate funding for both treatment and radioactive waste disposal, in addition to establishing procedures for disposal. These small rural water systems may be unable to bear the financial burden of compliance, endangering the water supply of rural communities.

#### **H. Recommended Improvements To The Regional Planning Process**

The shift to a grassroots/interest-group focused approach has fostered a great deal of positive citizen interaction and dialog within the Lower Colorado Region and with neighboring regions. At the same time, the first cycle through the new Senate Bill 1 planning process led the LCRWPG to suggest the following changes, all of which are designed to fine-tune the planning process as currently outlined in the law:

- Integrate water quality as well as water supply (quantity) considerations into the planning process;
- Establish a consistent policy statewide regarding the water conservation assumptions and the degree to which conservation might be used as a strategy to help ensure adequate supplies during drought;

- Provide continuous funding for improving the quality and quantity of water resources data available and information dissemination;
- Provide centralized administrative support and public information materials support to prevent each region from "reinventing the wheel" and duplicating efforts;
- Provide for the continuity of Regional Water Planning Groups between planning cycles;
- Improve representation of women and minorities in the membership of Regional Water Planning Groups; and,

Improve the estimation of economic losses from failing to supply water demand by conducting industry studies throughout economic regions (such as the Gulf Coast area for rice production and processing), rather than considering impacts within individual regions only.

#### **IV. Ecologically Unique Stream Segments And Reservoir Sites**

##### **A. General**

The potential for designating ecologically unique stream segments and potential reservoir sites surfaced many questions, concerns and recommendations from the members of the public attending Planning Group meetings and four special public comment meetings held by the Planning Group's committee devoted to this topic.

As an adjunct to the policy recommendations outlined above, the LCRWPG recommends legislative clarification be provided regarding Texas Water Code Section 16.051, which addresses this designation. Many participants requested that the terms be spelled out relative to how property rights and taxation might be affected.

No sites are recommended for designation due to the need for clarification of this section, but some sites have been identified as needing further study or meriting comment. A discussion of water quality issues within the basin is included in Appendix C.

##### **B. Ecologically Unique Stream Segments**

While the LCRWPG did not recommend any site for designation as an ecologically unique stream segment, the nine stream segments shown in Table E-3 were identified as meriting further study and future consideration for such designation.

**Table E- 3. Stream Segments Identified for Further Study**

Stream Segment	Location	Criteria Used
Barton Springs segment of the Edwards Aquifer	Recharge stretches of Barton, Bear, Little Bear, Onion, Slaughter, and Williamson Creeks in Travis and Hays counties.	<i>Riparian:</i> lower end is in a city park <i>Quality:</i> designated an "ecoregion" stream <i>Species:</i> only known population of the endangered <i>Eurycea sosrum</i> , salamander
Bull Creek	From the confluence with Lake Austin upstream to its headwaters in Travis County.	<i>Biologic:</i> nearly pristine <i>Hydrologic:</i> reduces flooding <i>Riparian:</i> in Bull Creek Preserve <i>Quality:</i> high aesthetic value <i>Species:</i> endangered salamander ( <i>Eurycea</i> sp.)
Colorado River	Within TNRCC classified segments 1409 and 1410 including Gorman Creek in Burnet, Lampasas, and Mills counties.	<i>Biologic:</i> white bass spawning area <i>Riparian:</i> in Colorado Bend State Park <i>Quality:</i> high aesthetic value <i>Species:</i> endangered Concho water snake; rare mollusks
Colorado River	TNRCC classified segments 1428 and 1434 in Travis, Bastrop, and Fayette counties.	<i>Biologic:</i> riverine habitat on Central Flyway <i>Hydrologic:</i> reduces flooding, filters water, connected to aquifers <i>Riparian:</i> in McKinney Roughs Environmental Learning Center <i>Quality:</i> aquatic life use <i>Species:</i> endangered blue sucker and Houston toad
Colorado River	TNRCC classified segment 1402 including Shaws Bend in Fayette, Colorado, Wharton, and Matagorda counties.	<i>Biologic:</i> riverine habitat on Central Flyway <i>Species:</i> endangered blue sucker
Cummins Creek	From the confluence with the Colorado River upstream to FM 159 in Fayette County.	<i>Quality:</i> designated an "ecoregion" stream
Llano River	TNRCC classified segment 1415 from the confluence with Johnson Creek to CR 2768 near Castell in Llano County.	<i>Quality:</i> exceptional aesthetic value
Pedernales River	TNRCC classified segment 1414 in Kimball, Gillespie, Blanco, and Travis counties.	<i>Biologic:</i> significant nature area <i>Riparian:</i> in 2 state parks, 1 national park , 1 city park <i>Quality:</i> exceptional aesthetic value
Rocky Creek	From the confluence with the Lampasas River upstream to the union of North Rocky Creek and South Rocky Creek in Burnet County.	<i>Quality:</i> designated an "ecoregion" stream

**C. Unique Reservoir Sites**

Eight specific reservoir sites, one reservoir enhancement project and several non-specific reservoir sites were considered as possible candidates for this designation. Table E-4 summarizes the sites considered and the corresponding recommendations.

**Table E- 4. Reservoir Sites Identified for Further Study**

Potential Site Location	LCRWPG Recommendation
Mills County: Off-channel reservoir alternatives for Blanket, Pompey, Browns, and Bennett Creeks, plus an in-channel alternative on the Colorado River	Support residents' efforts to construct reservoirs and pipelines for water supply.
Fayette & Colorado counties: Shaws Bend site	Oppose potential designation; would inundate 12,400 acres, and directly impact an additional 12,913 acres; would exacerbate flooding, adversely impact cultural and historic resources, bottomland forests, riverine habitat, and archaeological sites.
Colorado County: Cummins Creek site	Oppose potential designation; local community voiced strong opposition; would adversely affect 7,200 acres of bottomland forest, stream segments designated as "ecologically significant"; 15 dams already exist on the creek.
Llano County: Small in-channel check dams	Support further study and potential development of small in-channel check dams within existing flood plains; no specific sites yet identified; public support not determined; need has not been verified.
Llano County: Llano River diversion to Lake Buchanan	Support further study of this reservoir enhancement project; past studies and new technology indicate that this may be a desirable project; potential benefits would be an increase in Highland Lakes lake levels and improved Llano County flood control; cost-effectiveness and public support remain in question.
Fayette County: Clear Creek site	Oppose potential designation; local community voiced strong opposition, no potential projects officially under consideration for Clear Creek
Unspecified Locations: LCRA off-channel flood storage facilities	Support "no action" on LCRA permits for unspecified numbers and locations of facilities until more information is supplied; LCRA may have new information regarding storage options
Unspecified Locations: Study of LCRA off-channel flood storage facilities	Support further study and potential development for priority use within the Lower Colorado River Basin; specific locations not yet identified, potential impacts on recommended upstream reservoir projects undefined