



## DRAFT MEMORANDUM

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**TO:** Region C Water Planning Group

**FROM:** Tom Gooch File: NTD0218202182\T\Task 4 - Water Mgmt Strategies\WWPs\TRWD\TRWD Plan.doc

**PROJECT:** NTD-02182, Region C Water Plan

**SUBJECT:** Water Management Strategies for Tarrant Regional Water District

**DATE:** April 20, 2005

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The Tarrant Regional Water District (TRWD) is a Wholesale Water Provider in the Region C water planning area. This memorandum describes the water supply plans proposed for TRWD for the *2006 Region C Water Plan*. The memorandum includes the following sections:

- Demands
- Existing Supplies and Comparison of Supplies and Demands
- Potential Water Management Strategies Considered for TRWD
- Recommended Water Management Strategies and Alternatives

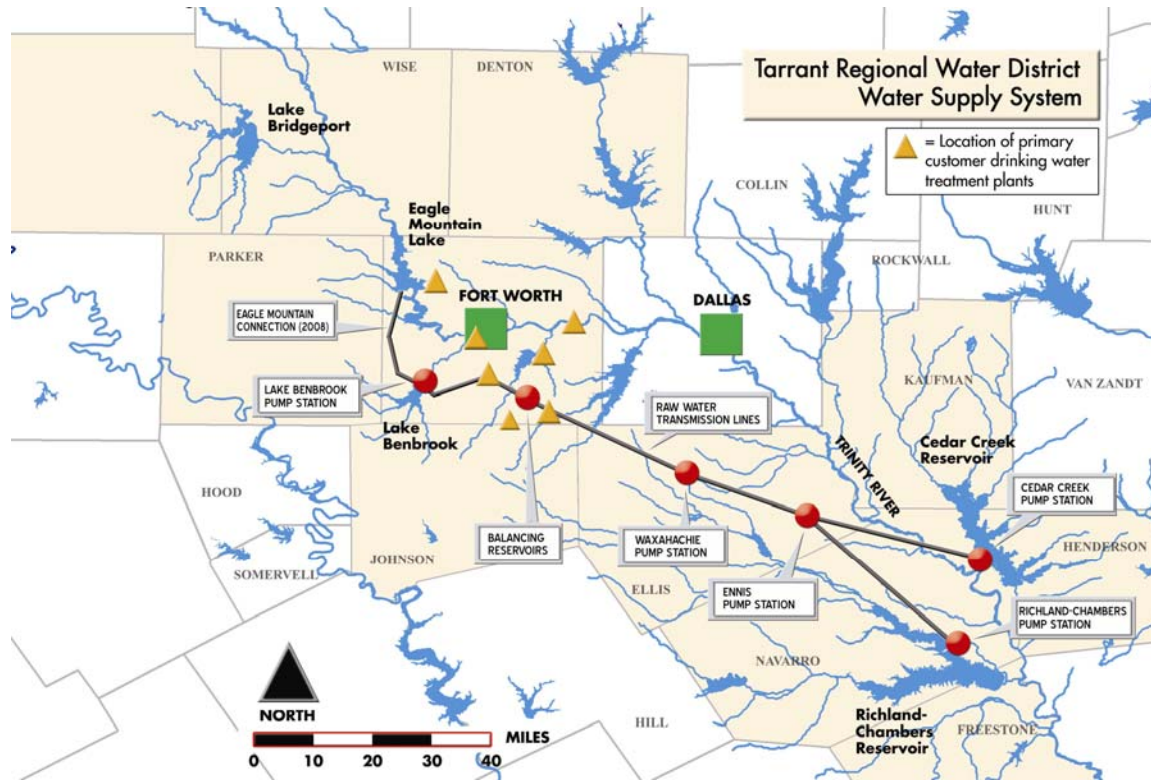
### **Demands**

Table 1 shows the projected demands on the Tarrant Regional Water District from existing and potential customers. Figure 1 shows the demands by category of customer. The demand for water from the District is projected to grow to 890,334 acre-feet per year by 2060. Attachment A has more detailed information on total demands for TRWD customers, supplies available to those customers from other sources, and supplies needed from TRWD.

### **Existing Supplies and Comparison of Supplies and Demands**

Figure 2 shows the existing Tarrant Regional Water District water supply system. Table 2 shows the sources of supply currently available to TRWD and compares the current supplies to the projected demands. TRWD's currently available supplies are based on a safe yield analysis, since that is how they operate their system. Figure 3 is a graphical comparison of current supplies and projected demands. The currently available supplies for TRWD range from 447,037 acre-feet per year in 2010 to 394,049 acre-feet per year in 2060. (The reduction in supply over time is due to sedimentation in TRWD's reservoirs.) TRWD has enough currently available water supplies to meet projected demands through 2010. TRWD needs to develop an additional 496,285 acre-feet per year of supplies by 2060.

**Figure 2: Tarrant Regional Water District Water Supply System**



### Potential Water Management Strategies Considered for TRWD

Table 3 lists the potentially feasible water management strategies considered for the Tarrant Regional Water District and gives information on the supply, cost, unit cost, reliability, environmental impacts, etc., for each strategy. Figure 4 shows the comparative unit costs of the strategies.

### Recommended Water Management Strategies and Alternatives

The Region C consultants met with Tarrant Regional Water District staff to discuss the potentially feasible water management strategies. TRWD staff indicated that the District wishes to pursue the following as recommended strategies:

- Conservation
- Eagle Mountain Connection
- Third Pipeline and Reuse
- Marvin Nichols Reservoir

- Toledo Bend Reservoir
- Oklahoma Water

These strategies are discussed individually below.

Conservation. Conservation is the projected conservation savings for TRWD's existing and potential customers, based on the Region C recommended water conservation program. Not including savings from low plumbing fixtures (which amount to about 5 percent of demand and are built into the demand projections) and not including reuse, conservation by TRWD customers is projected to reach 83,975 acre-feet per year by 2060.

Eagle Mountain Connection. The Eagle Mountain Connection consists of pipelines and pump stations to convey water delivered from TRWD's East Texas reservoirs (Cedar Creek Lake and Richland-Chambers Lake) to Eagle Mountain Lake on the West Fork of the Trinity River. The Eagle Mountain Connection will not increase the total amount of water supply available to TRWD. It will increase the amount that can be delivered to the rapidly-growing North Tarrant County area, greatly increase the reliability of the TRWD system, reduce the frequency of drought operation for TRWD's customers, and delay the construction of TRWD's third pipeline. The project is currently under design and is scheduled to be in operation by 2008.

Third Pipeline and Reuse. TRWD recently received a permit from the Texas Commission on Environmental Quality allowing the diversion of return flows of treated wastewater from the Trinity River. The water will be pumped from the river into constructed wetlands for treatment and then pumped into Richland-Chambers Lake and Cedar Creek Lake. The wetlands project will increase the safe yield of the two lakes to the permitted amounts (increasing the total 2060 TRWD system safe yield by 92,635 acre-feet per year) and provide an additional 115,500 acre-feet per year of new supply. Thus, the total supply made available by the reuse project is 208,135 acre-feet per year in 2060. In order to deliver the currently available supplies and the supplies developed from the reuse project, TRWD will need to build a third pipeline from Richland-Chambers Lake and Cedar Creek Lake to Tarrant County. The Richland-Chambers Lake reuse project will probably be built first, around 2010. The Cedar Creek Lake reuse project and the third pipeline will be needed around 2018.

Marvin Nichols Reservoir. The Tarrant Regional Water District has been working with other Metroplex water suppliers and the Sulphur River Basin Authority to study the proposed Marvin Nichols Reservoir in East Texas. Marvin Nichols Reservoir was a recommended project in the *2001 Region C Water Plan*. The project would provide a large source of additional supply for the Metroplex at a relatively low cost. At the present time, TRWD, the North Texas Municipal Water District and the Upper Trinity Regional Water District plan to pursue Marvin Nichols Reservoir as a recommended strategy. Dallas Water Utilities and Irving consider the project to be an alternative source of supply in their planning. The total yield of Marvin Nichols Reservoir is 612,300 acre-feet per year, assuming that Ralph Hall Lake is senior to Marvin Nichols Reservoir and that Marvin Nichols Reservoir is operated as a system with Lake Wright Patman. TRWD plans to use 280,000 acre-feet per year of that supply. The delivery system from Marvin Nichols Reservoir (which is

three-quarters of the total cost of the project) will be developed in phases. Phase 1 would be developed by 2030 and would include the reservoir and the initial pipelines and pump stations. Phase 2, planned for 2050, would include parallel pipelines and additional pump stations to deliver the remainder of the supply from the project.

Toledo Bend Reservoir. The Tarrant Regional Water District is working with the Sabine River Authority and other Metroplex water suppliers to study the potential delivery of water from Toledo Bend Reservoir in East Texas for use in the Upper Sabine Basin (the North East Texas Region, also called Region D) and in Region C. At the present time, TRWD and the North Texas Municipal Water District (NTMWD) plan to include Toledo Bend Reservoir as a recommended strategy in their plan. Dallas Water Utilities considers the project to be an alternative source of supply. With participation from TRWD and NTMWD in Region C, the project would include the delivery of 500,000 acre-feet per year of water from Toledo Bend Reservoir – 100,000 acre-feet per year for the Sabine River Authority to supply the upper Sabine Basin and 200,000 acre-feet per year each for TRWD and NTMWD. The facilities to deliver the water would be developed in phases, with Phase 1 planned for 2050 and Phase 2 planned after 2060.

Oklahoma. The Tarrant Regional Water District and other Metroplex suppliers have been pursuing the purchase of water from Oklahoma. At the present time, the Oklahoma legislature has established a temporary moratorium on the export of water from the state. In the long run, Oklahoma remains a promising source of water supply for Region C. At the present time, TRWD, the North Texas Municipal Water District, and the Upper Trinity Regional Water District (UTRWD) plan to develop water from Oklahoma as a recommended strategy. Dallas Water Utilities and Irving consider water from Oklahoma to be an alternative source of supply. The project is planned for 2060 and includes 50,000 acre-feet per year each for TRWD and NTMWD and 15,000 acre-feet per year for UTRWD.

Table 4 and Figure 5 show the recommended plan for water supply development for the Tarrant Regional Water District. With the recently-permitted reuse project, over 26 percent of the projected 2060 supply for the TRWD will be from conservation and reuse. (Note that this does not include conservation due to low-flow plumbing fixtures, which is built into demand projections and would add about 5 percent more to the percentage of supplies from conservation and reuse.) Table 5 gives information on the capital and unit costs for the recommended water management strategies. (Cost estimates for conservation efforts will be developed for the individual water user groups.) Attachment B includes detailed cost estimates for the recommended water management strategies. The estimated cost for TRWD's share of its recommended water management strategies is slightly over \$3.5 billion, based on 2002 construction costs.

TRWD staff has also indicated that the District might pursue the following alternative water management strategies:

- Toledo Bend Reservoir Phase 2 (accelerated to occur before 2060)]
- Wright Patman Lake
- Sam Rayburn/B.A. Steinhagen
- Lake Tehuacana

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- Livingston
- System operation
- Paluxy groundwater wells near Eagle Mountain Lake

Table 6 gives information on costs for the first four alternative strategies, and Attachment C contains detailed cost estimates for these alternatives. Cost estimates are not currently available for system operation and Paluxy groundwater wells.

**Attachment A**  
**Projected Demands for the Tarrant Regional Water District**

**Attachment B**  
**Cost Estimates for Recommended Water Management Strategies**

**Attachment C**  
**Cost Estimates for Alternative Water Management Strategies**