

# REGION C WATER PLANNING GROUP

Senate Bill One Fifth Round of Regional Water Planning - Texas Water Development Board

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*Dr. Tom Woodward*

April 10, 2018

Jeff Walker  
Texas Water Development Board  
1700 North Congress  
Austin, Texas 78711-3231

RE: Request for Modifications to TCEQ Water Availability Models for Planning Purposes

Dear Mr. Walker:

Region C is located primarily within the Trinity and Red River Basins. Small areas of the region are in the Sabine, Sulphur and Brazos River Basins. Reservoirs in each of these river basins and the Neches River Basin supply water to Region C. As part of the 2021 planning efforts, the Full Authorization Water Availability Models (WAM) for each of these basins will be updated to determine surface water availability in the region. To more accurately reflect the current conditions and operations of the region, the following hydrologic variances are requested.

### Safe Yield

Based on requests from Tarrant Regional Water District (TRWD) and Dallas Water Utilities, Region C requests the use of safe yield for the allocation and distribution of surface water supplies from reservoirs owned and operated by these two wholesale water providers. The TRWD reservoirs include Lake Bridgeport, Eagle Mountain Lake, Lake Worth, Lake Benbrook, Lake Arlington, Richland-Chambers Reservoir and Cedar Creek Reservoir. Dallas reservoirs include Lake Ray Roberts, Lake Lewisville, Lake Grapevine, Lake Ray Hubbard, Lake Tawakoni, and Lake Fork. For some of these lakes, Dallas holds only a portion of the water rights. Supply for the other water right holders in these lakes will continue to be calculated using firm yield.

Safe yield is the amount of water that can be used during the critical drought while leaving a minimum supply in reserve. (For TRWD this minimum is a one-year supply; for Dallas this minimum is approximately nine months of supply.) Safe yield is consistent with the current operations of these two surface water suppliers and previous regional water planning. In accordance with the TWDB planning rules, firm yields will also be determined and reported in the plan.

### Trinity River WAM

Multiple changes are requested for the Trinity WAM to account for current operating conditions, including:

- Subordination agreements,
- System operations, where appropriate, and
- Other corrections noted during review of the models.

c/o TRA  
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These changes are detailed in Attachment A.

Red River WAM

Water supplies from the Red River Basin include supplies from Lake Texoma, several small lakes, and run of the river supplies. Hydrologic variance requests for the Red River WAM include changes to Lake Texoma and associated water rights. These changes are detailed in Attachment A.

Sulphur River WAM

For the Sulphur River Basin, we propose to extend the Sulphur River WAM hydrology for Lake Chapman to include the new critical drought period for the reservoir.

Other WAMs

For the 2021 Region C Water Plan, we request to use the Neches and Sabine River WAM models as modified by the Region I Planning Group with the approval of the Texas Water Development Board. For supplies in the Brazos River Basin, we request to use the Brazos G WAM as modified by the Brazos G Planning Group with the approval of the Texas Water Development Board.

As intended by Senate Bill 1, the assessment of surface water availability in Region C will be conducted to accurately reflect water supplies that are available for use.

Please call me if you have any questions regarding our request.

Sincerely,



Jo M. (Jody) Puckett

Chair, Region C Water Planning Group

C: Kevin Ward, Region C Secretary  
Connie Townsend, TWDB Project Manager  
Amy Kaarlela, Freese and Nichols, Inc.

**Attachment A**

**Proposed Region C Modifications to the TCEQ WAMs**

## **Attachment A – Proposed Region C Modifications to the TCEQ WAM**

In accordance with the Texas Water Development Board's (TWDB) established procedures, surface water supplies will be determined using the TCEQ-approved Water Availability Models (WAM). The WAM models were developed for the purpose of reviewing and granting new surface water rights permits. The assumptions in the WAM models are based on the legal interpretation of water rights, and in some cases do not accurately reflect current operations. Availabilities for each water right are analyzed in priority date order, with water rights with the earliest permit date diverting first. WAM Run 3, which is the version used for planning, assumes full permitted diversions by all water rights and no return flows unless return flows are specifically required in the water right. Run 3 also does not include agreements or operations that are not reflected in the water right permits and does not account for reductions in reservoir capacities due to sediment accumulation. For planning purposes, adjustments were made to the WAMs to better reflect current and future surface water conditions in the region. Generally, changes to the WAMs included:

- Inclusion of subordination agreements not already included in the TCEQ WAM.
- Inclusion of system operation where appropriate.
- Use of minimum storage elevations for Corps reservoirs, where appropriate. Most Corps storage contracts specify a minimum elevation for water supply use.
- Other corrections as needed.

Specific adjustments to the WAMs to more accurately reflect the water rights and agreements for water supply sources in Region C are listed below.

### **Trinity River Basin WAM**

The Trinity WAM proposed for use in the 2021 Region C Plan is a draft version of the WAM obtained from TCEQ in December 2017. This version of the WAM contains major amendments granted to the City of Dallas and the North Texas Municipal Water District which are not included in the model currently available (as of April 2018) on the TCEQ website. All other WAMs are based on the most recent available model files.

- Modeling of Lake Jacksboro and Lost Creek Reservoir as a system. System modeling includes subordination of Lake Bridgeport.
- Modeling of Tarrant Regional Water District's West Fork reservoirs (Bridgeport, Eagle Mountain, and Worth) as a system.
- Inclusion of a minimum elevation for Lake Fairfield (305.0 ft. msl) for the firm yield calculation. This is the minimum operating elevation for the intake to the power plant according to the *1999 Volumetric Survey of Fairfield Lake* prepared by the Texas Water Development Board. For yield calculation for other water rights, the full storage of Lake Fairfield is used.
- Modeling of Dallas' water rights in the Elm Fork of the Trinity River as a system with Lakes Grapevine, Lewisville and Ray Roberts.
- Revised modeling of Lake Lavon used for recent amendment applications for the North Texas Municipal Water District. It is our understanding that TCEQ will adopt this modeling when they

update the WAM.

- Use of the full storage for Forest Grove Reservoir with an annual depletion limit of 16,348 acre-feet per year. The TCEQ WAM incorrectly uses the 16,348 acre-feet as the storage of the reservoir.
- Modeling of Corsicana's rights from Richland-Chambers Reservoir as a system with Lake Halbert, reflecting how these rights are actually used.
- Modeling of Lake Benbrook as one pool instead of multiple pools to facilitate calculation of yields. The current modeling incorrectly assigns evaporation to the dead pool of the reservoir which does not refill because it is modeled as non-priority. In actual operation, TRWD cannot use water from the reservoir unless this dead storage is full. This modeling respects the USACE minimum elevation for water supply.

### **Red River Basin WAM**

- Modeling of Lake Randell and Valley Lake as stand-alone reservoirs without Lake Texoma backups for the firm yield calculation of these two reservoirs. Backup supply for these reservoirs from Lake Texoma is included in the supplies from Lake Texoma. This prevents double counting of the makeup water from Lake Texoma. For firm yield calculations for reservoirs other than Lake Randell, Valley Lake and Lake Texoma, the backups for Lake Randell and Valley Lake were retained.
- Lake Texoma is located on the Texas-Oklahoma border, and in accordance with the Red River Compact, water in Lake Texoma is equally shared by Texas and Oklahoma. There are three distinct water storage pools in Lake Texoma: 1) water supply, 2) hydropower, and 3) sediment storage (dead pool). Use of water from Lake Texoma is authorized by multiple Texas water rights and Oklahoma water rights, as well as authorizations by the US Congress and contracts with the Corps. To assess the firm yield of the reservoir for Region C, the total firm yield for both the water supply and hydropower pools were modeled. This total yield was equally split between Texas and Oklahoma. The reliable supplies from the lake are limited to the Texas water rights and associated storage contracts with the Corps.
- Removal of diversion backups of individual Texas water rights in Lake Texoma from the hydropower pool. All Texas water rights are 100% reliable in the WAM, so these backups are not invoked in the WAM. The code was removed because it made the modeling unnecessarily complicated.