

Region C Water Planning Group Meeting

TRA Central
Wastewater Treatment Plant
February 12, 2004



Agenda

- Action Items for Consideration
 - Supplemental Funding
 - Wholesale Water Providers
- Discussion Items
 - Introduction to WAM
 - TWDB Presentation on Instream Flow Analysis
 - Inclusion of Return Flows in WAM
 - Current Water Supplies Update
 - Water Conservation and Reuse

Agenda (continued)

- Process to Screen Water Management Strategies
- Overall Status and Next Steps
- Additional Action Items
 - Recommended Control Points for TWDB WAM
 - Surveys on Meeting Future Water Needs

Action Item for Consideration

Supplemental Funding

Supplemental Funding

- TWDB issued a request for proposal (RFP) on January 21, 2004
- Proposals are due April 1, 2004
- \$1.6 million available
- Request for supplemental funding will require 30-day notification prior to TWDB consideration in May

Supplemental Funding

- Available for addressing changed conditions
 - Unanticipated changes to the amount of water supply available to meet needs
 - Oklahoma unavailable
 - Lowered Carrizo-Wilcox aquifer supply

Supplemental Funding

- Unanticipated changes to the volume or magnitude of water supply needs due to greater than anticipated population growth or water demands
 - Increased demands will need additional supplies

Supplemental Funding

- Development of new technology or availability of new supplies to meet water supply needs that were not recognized when the original scope of work was developed
 - Desalination and Lake Texoma
 - New conservation methods
 - Additional reuse
 - Wright Patman
 - Ralph Hall Reservoir
 - Groundwater being marketed from the Simsboro portion of the Carrizo Wilcox aquifer

Supplemental Funding

- Potential projects
 - Reimbursement for costs associated with Anna and Athens amendments
 - Reimbursement for supplemental funding notice
 - Increased public participation needs due to increased media coverage of potential projects
 - Additional reuse studies
 - Wright Patman reallocation

Supplemental Funding

- Additional water conservation studies not addressed by the TWDB's water conservation report
- Desalination of Texoma water
- Intensive interaction with Regions D and I

Supplemental Funding

- Proposed tasks in priority order

Amendments to 2001 Plan for Anna and Athens	\$17,300
Notice for Supplemental Funding	\$8,100
Additional Public Participation Efforts	\$120,000
Water Reuse Analysis	\$150,000
Wright Patman Reallocation	\$30,000
Desalination of Texoma Water	\$50,000
Additional Conservation Analysis	\$25,000
Intensive Interaction with Region D	\$25,000
Intensive Interaction with Region I	<u>\$25,000</u>
TOTAL	\$450,400

Supplemental Funding

- Consultants seeking approval to prepare an RFQ to be presented in March for RCWPG approval

Action Item for Consideration

Wholesale Water Providers

Wholesale Water Providers

- TWDB definition:
 - Wholesale water provider is any entity that sells (or has sold) 1,000 acre-feet of wholesale water per year in the last 5 years, or is expected to sell 1,000 acre-feet of wholesale water per year. This includes water sold for municipal, irrigation, and/or industrial purposes.

Wholesale Water Providers

- Consultants provided list of proposed wholesale water providers
- Consultants are seeking approval to submit this list to the TWDB for their approval

Recommended list of WWTPs

- City of Cedar Hill
- City of Corsicana
- City of Dallas
- City of Denton
- City of Forney
- City of Fort Worth
- City of Garland
- City of Midlothian
- City of North Richland Hills
- City of Rockwall
- City of Terrell
- City of Weatherford
- Athens MWA
- Dallas County Park Cities MUD

Recommended list of WWPs

- Greater Texoma Utility Authority
- Lake Cities MUA
- Midlothian Water District
- North Texas Municipal Water District
- Parker County Utility District #1
- Sabine River Authority
- Sulphur River Water District
- Tarrant Regional Water District
- Trinity River Authority
- Upper Neches Municipal Water District

Recommended list of WWTPs

- Upper Trinity Regional Water District
- Wise County WSD

Discussion Item

Introduction to Water Availability
Modeling (WAM)

What is a WAM?

- Computer Model of a River Basin
- Determines available surface water supplies at specified locations
 - USGS gauging stations
 - Locations of water rights diversions
 - Other points of interest

What can the WAM tell you?

- Reliability of existing water rights
- Availability of water for future water rights
- Firm Yields of Major Reservoirs

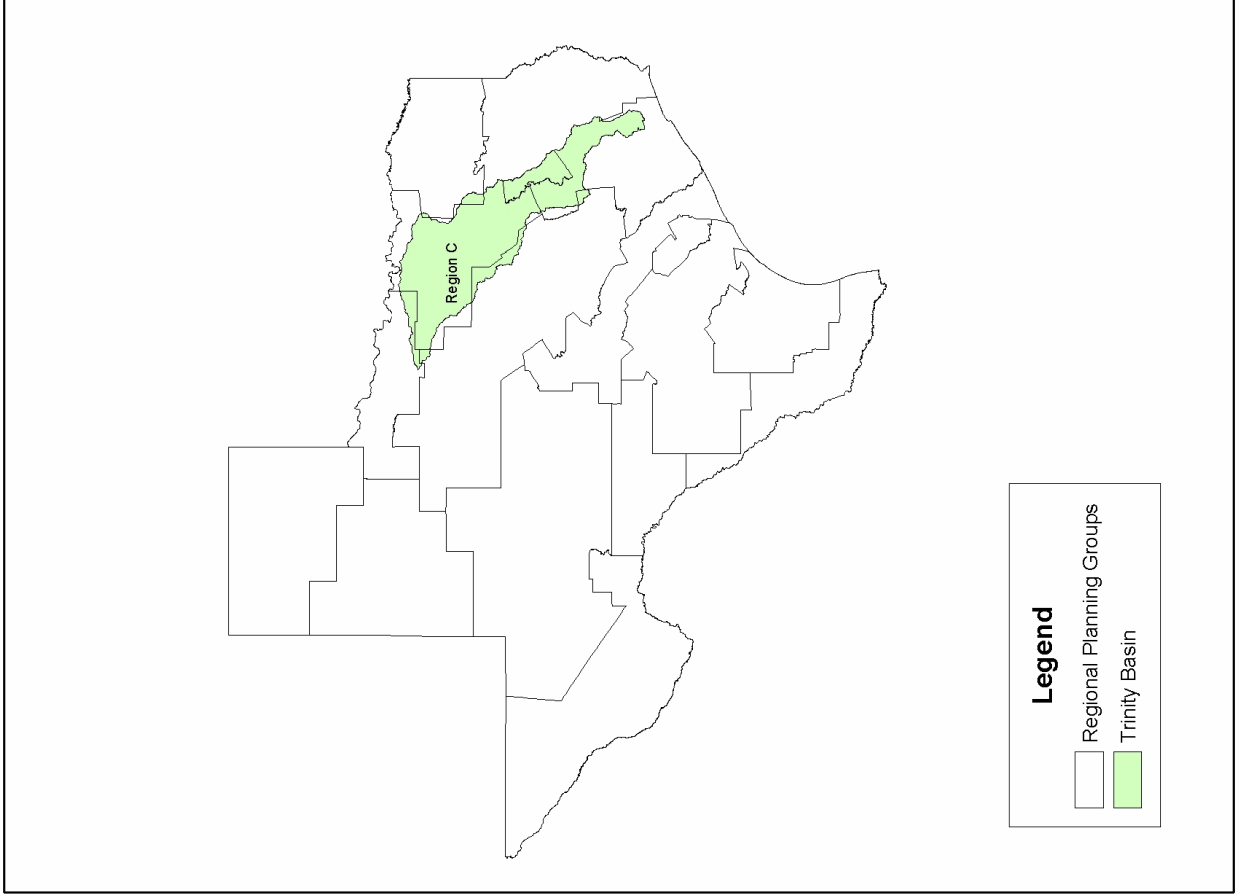
What the WAM Cannot Tell You

- Information that requires smaller time steps (smaller than monthly)
 - Flood control operation
 - Environmental flows
 - Hydropower operation (hydropower is included for purposes of water supply impacts)
- Complex system operations

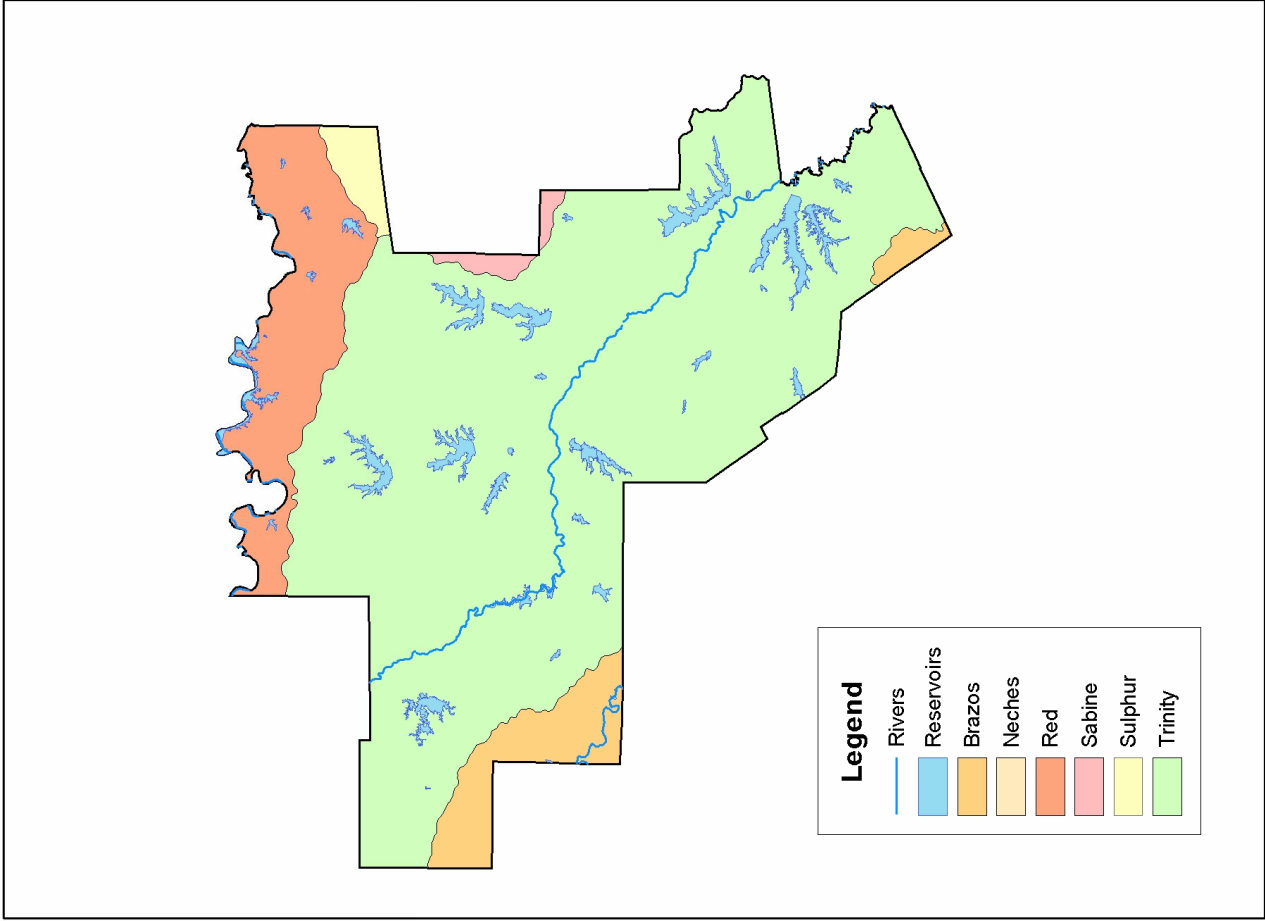
Background

- SB1 authorized WAMs
- TCEQ oversight program
- Uses the Water Rights Analysis Package (WRAP) computer model
- Designed to aid in evaluating new permit requests
- Region C supplies– Trinity, Red, Neches, Sulphur and Sabine River Basins

Region C



River Basins in Region C



Definitions

- **Priority Order**
 - Water rights are diverted by priority date (earliest to latest)
- **Natural Order**
 - Water rights diverted from upstream to downstream
- **Naturalized flows**
 - Historical flows adjusted for man-made influences

Definitions

- **Firm Yield**
 - Amount of water that can be drawn reliably from a reservoir
- **Run-of-the-River**
 - Water rights diverted directly from the stream.
- **Control Point**
 - Point of diversion or
 - Gauging station with hydrologic data

Information Needed

- Hydrologic data
 - Naturalized flow
 - Evaporation & precipitation for reservoirs
- Water rights
 - Diversion
 - Storage
 - Priority
 - Spatial distribution
- Return flows

How does the WAM work?

- Monthly time step
- Calculates flows at each control point
 - Starts with naturalized flows
- Simulates diversions, evaporation and filling of storage in reservoirs, and return flows
- Redistributes flow

WAM Scenarios

- Order of Diversions
 - Natural order
 - Priority Order
- Diversion Amounts
- Return Flows
- 9 Scenarios (Runs) developed under WAM program

TCEQ Permitting Scenarios

- Run 3 – Perpetual water rights
 - Full Authorization of Permits
 - No Return Flows
 - Priority Order
- Run 8 – Term water rights
 - Current level of diversions
 - Current return flows
 - Priority Order

Key Assumptions for WAMS

- Priority date is the governing factor
- 100% reuse of wastewater (Run 3)
- Complete filling of storage prior to junior diversions (storage priority has same weight as diversion priority)
- Full use of permitted diversion and permitted storage (Run 3)

How is this Different from Reality?

- Priority is the governing factor
 - In the absence of a Water Master, water rights holders divert or store water until a priority call is made
 - A Water Master Program may or may not allocate water in priority order
- 100% reuse of wastewater
 - In Region C, no city is proposing 100% reuse. Return flows are available to downstream water users. With higher water use, there will be more return flows, even if a greater % is reused.

How is this Different from Reality?

- All water rights operate at their authorized diversions
 - Many water rights are not fully utilized, making water available for other water rights
- Storage priority has the same weight as diversion priority
 - Upstream junior water rights divert even though downstream senior storage is not full

Previous Hydrologic Studies

- Single reservoir or system analyses
- Retained all inflows into reservoir
- May have considered releases only for instream flows and to meet senior downstream diversions (not permitted storage)
- Considered historical use/demands in analysis
- Included return flows

How are the WAMs to be used in Planning?

- TWDB – WAM, Run 3 is to be used for water availability assessments
 - Run 3 – conservative assumptions
 - Priority order – protects senior water rights, may not reflect actual operation
- With some modifications, many WAMs can be used for planning
 - Special conditions
 - Operational agreements

Specific Concerns for Region C

- No return flow assumption
 - Trinity Basin
- Some system operations are difficult to model
- System operation with reservoirs in multiple basins

Discussion Item

**TWDB Presentation on Instream
Flow Analysis by Kris Martinez**

Discussion Item

Inclusion of Return Flows in
WAMs

Adding Return Flows to WAMS

- Brazos G wrote letter to TWDB in January 2004 (provided to RCWPG prior to this meeting)
- Highlights of Brazos G Letter
 - Request that the TWDB allow wastewater treatment plant effluent (return flows) to be included in WAM
 - Return flows should be included for existing and future supply analyses

Adding Return Flows to WAMS

- Justification to include return flows
 - Exclusion of return flows implies that full consumptive reuse will occur in the future. Brazos G does not agree that this will be the case by 2060.
 - Exclusion of return flows presupposes adoption of full consumptive reuse as a water management strategy. No entity in the Brazos Basin has expressed interest in reusing 100% of its wastewater.

Adding Return Flows to WAMS

- Exclusion of return flows will result in greater projected needs and more water management strategies
- Return flows can be incorporated into the permitting process at TCEQ
- Exclusion of return flows constitutes a commitment of effluent to instream flows without due public consideration
- Inclusion or exclusion of effluent discharge is important in the planning process and should be made through open public discourse.

Adding Return Flows to WAMs

- TWDB approach to considering return flows in regional water planning
 - WAM Run 3 assumes zero return flows unless specifically identified in the water right
 - Proposed surface water supplies are to be analyzed with WAM Run 3, assuming no return flows
 - Reuse projects can be included in the plans
 - TWDB will use modified version of WAM Run 3 assuming no return flows to evaluate impact of regional plans on instream flows

Adding Return Flows to WAMS

- Concerns regarding the problems created by the TWDB's assumptions
 - Reuse of treated wastewater effluent is vitally important to future supplies
 - Assumption of no return flows is contrary to fact
 - Assumption of no return flows is contrary to existing regional water plans
 - Assumption of no return flows when evaluating the impact on instream flows will invalidate the study

Adding Return Flows to WAMS

- Reuse is Vitally Important
 - Assuming no return flows when applying WAM Run 3 by definition will show no yield from indirect reuse projects
 - Must allow other analyses besides WAM Run 3 for indirect reuse

Adding Return Flows to WAMS

- **Assuming No Return Flows Contradicts Fact and the Regional Plans**
 - Currently, there is substantial return flow of treated wastewater effluent in Region C
 - Significant return flows upstream of reservoirs supplement yields
 - Significant return flows downstream supplement natural flows and provide enhanced habitat for fish and wildlife
 - No proposals to reuse all of the wastewater effluent in Region C

Adding Return Flows to WAMS

- Zero Return Flows Will Invalidate the Instream Flows Study
 - 2001 plan had 975,000 acre-feet per year unreused return flows
 - TWDB analysis assumes those disappear
 - Totally inconsistent with Region C plan
 - Increase confusion over instream flows and the impact of the regional water plans on instream flows

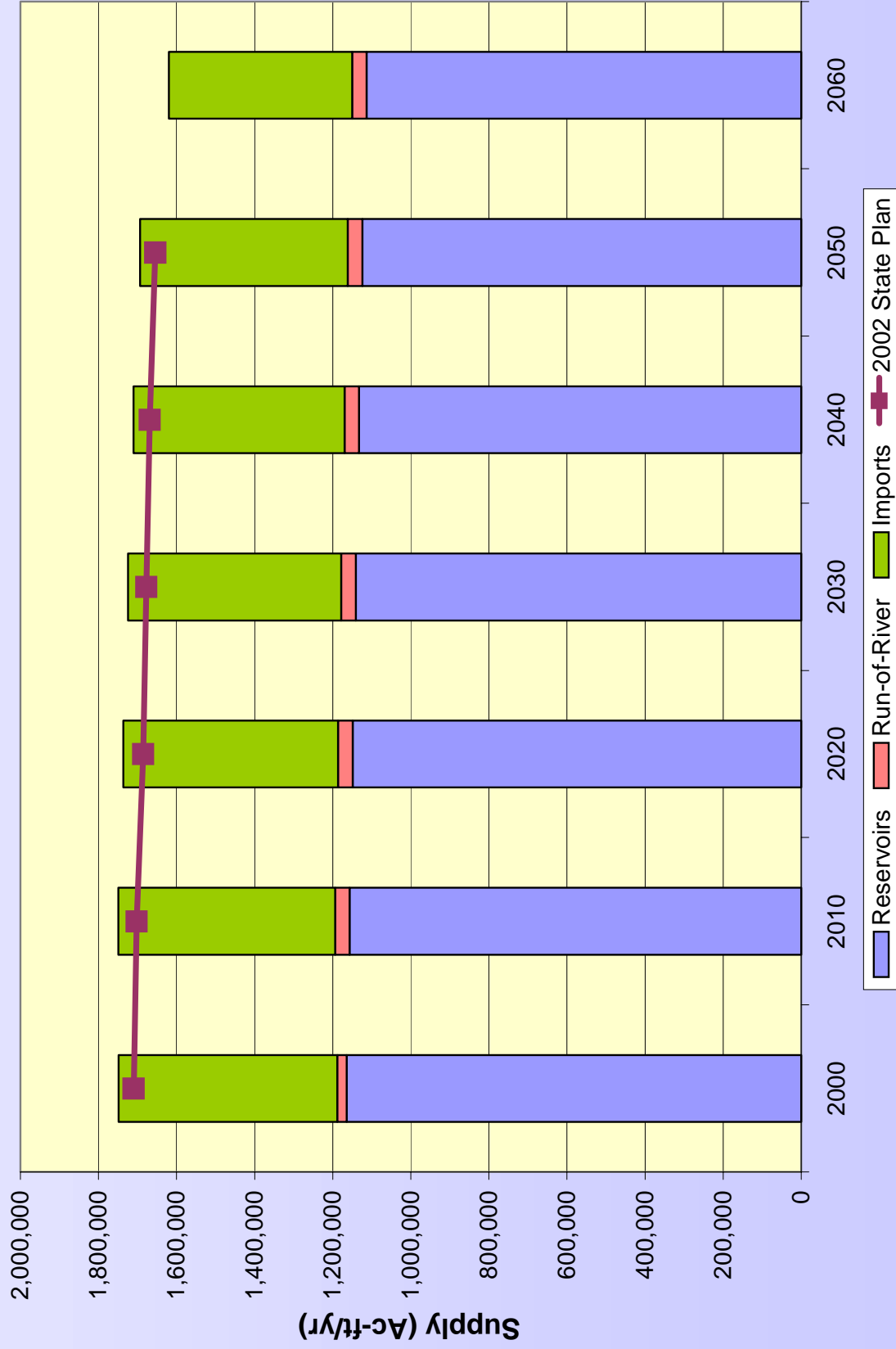
Discussion Item

Update on Task 3 – Current Water
Supplies

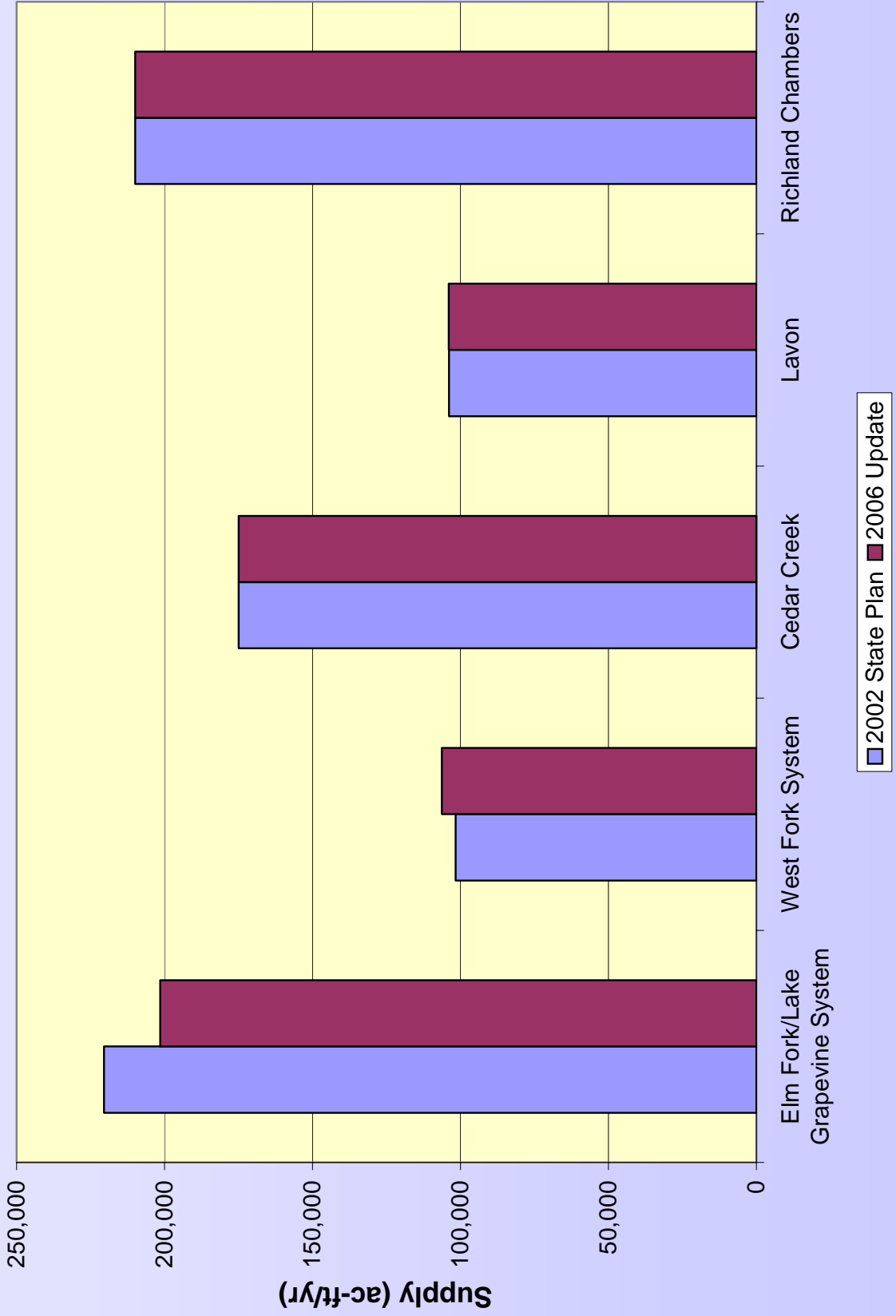
WAM Results

- WAM analyzed for the Trinity, Neches, and Sabine River Basins
- The Red River WAM is being corrected and should be available this spring
- Updated yields for Trinity Basin reservoirs and imports from Neches and Sabine Basins
- Overall, WAM showed similar yields to those applied to the first phase of SB1 planning
- Results are preliminary

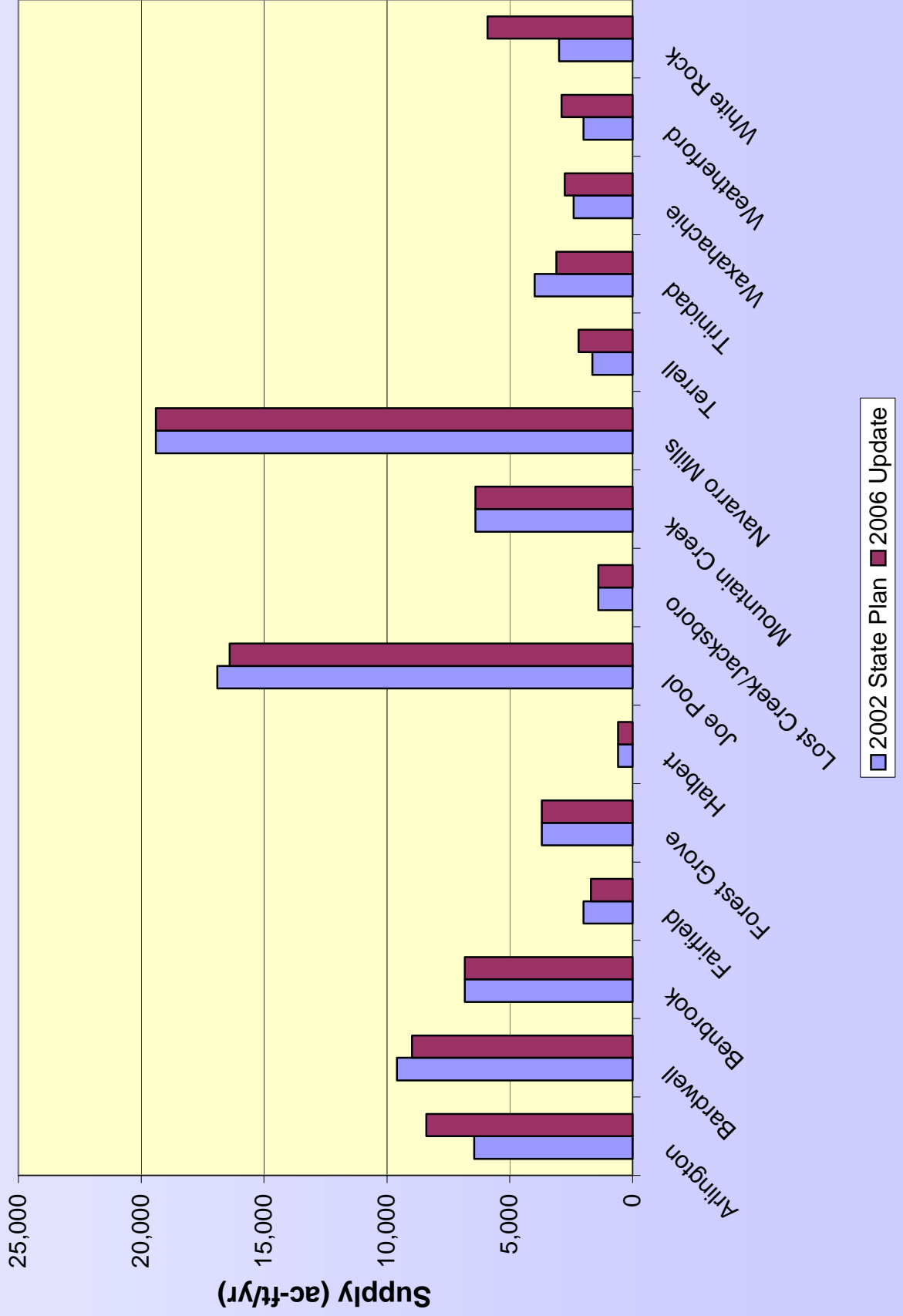
Region C – Surface Water



Large Reservoirs



Trinity Basin Reservoirs



GAM Results

- TWDB sent notice at the end of January that they expect to have the results of the Carrizo-Wilcox GAM analysis by the end of February

Discussion Item

Water Conservation and Reuse
Activities

WATER CONSERVATION ACTIVITIES

- Developing model municipal water conservation plan
- Reviewing and summarizing water conservation plans
- Performing neighborhood conservation study
 - Completed analysis of effectiveness of customer water audits in Denton
 - Analyzing data for other cities (in progress)
- Coordinating with statewide SB1094 Water Conservation Implementation Task Force
- Each of these activities help establish the basis for evaluation of water conservation management strategies

Water Conservation Plan Summaries

- Identify conservation methods already used in Region C
- Identify conservation methods used by cities in other Regions
- Identify cities/WSCs to use as a resource regarding effectiveness of different conservation methods
- Also helps in development of model water conservation plans

Major City Water Conservation Plans

- Reviewed water conservation plans for 7 major cities in Texas:
 - Austin (1999)
 - Corpus Christi (1999)
 - Dallas (1999)
 - Fort Worth (2003 Draft)
- Limited information from El Paso website

Widespread Application

- According to the water conservation plans, each of the above cities is active in the following water conservation categories:
 - Customer Meters
 - Universal metering
 - Periodic testing, repair, and replacement
 - Leak Detection and Unaccounted-For Water
 - Public Education
 - Conservation brochures
 - School programs

Widespread Application (continued)

- Low-Flow Plumbing Fixture Ordinance
- Leak Detection and Unaccounted-For Water
- Public Education
 - Conservation brochures
 - School programs
- Per Capita Water Usage Goals

Widespread Application (continued)

- Inclined Block Water Rates (6 of 7)
- Reuse (5 of 7)
- Reservoir/Aquifer Operation Plan (4 of 7)
- Unaccounted-For Water Goals (5 of 7)
- Landscape Water Management (5 of 7
have one or more of the following)
 - Ordinances regarding types and/or frequency of irrigation
 - Rebates for water-efficient landscaping
 - Xeriscape Demonstration Gardens

More Limited Application

- Customer Water Audits (Houston, San Antonio, Austin)
- Low Cost Toilet Retrofits (Austin, San Antonio, El Paso)
- Clothes Washer Rebates (Austin, San Antonio, El Paso)
- Low Cost Plumbing Fixtures (Austin)
- Pressure Control (Houston)

Neighborhood Conservation Study: Denton Customer Water Audits

- When customer requests water audit:
 - Review water usage to determine whether within normal seasonal range
 - Discuss water usage habits with customer:
 - How many washing machine loads per week? Full?
 - How many dishwasher loads per week? Full?
 - How many residents?
 - What are sprinkler settings? How many times per week is lawn watered? How long in each zone?
 - Swimming pool? Jacuzzi? Water filter or purifier?

Denton Customer Water Audits (Continued)

- When customer requests audit (cont.):
 - If no cause for high water usage identified, then site visit
 - Check for leaks
 - Check irrigation system
 - Review conservative water usage habits
 - Identify ways to save water

Denton Customer Water Audits (Continued)

- Currently 24,976 water customers
- 102 water audits in 2.5 years (0.16 percent of customers per year)
- 25 customers with 1 year of water usage history before and after audit
- Modeled monthly water usage with two variables: monthly average high air temperature and date that water audit conducted

Denton Customer Water Audits (Continued)

- Customer water audit was statistically significant for 11 of 25 customers
- These 11 experienced an average savings of 34 percent.
- For the 25 audited customers, the savings averaged 15 percent.
- Based on literature, anticipate savings will last three years.

Denton Customer Water Audits (Continued)

- Using current participation rate and average savings of 15 percent for audited customers, estimate that the program saves about 12.5 ac-ft/yr, or 0.14 gpcd.
- Working with City to quantify cost-effectiveness of program.
- Customer water audits have been effective where practiced, but the participation rate has been relatively low.

Extension of Denton Customer Water Audit Results

- Anticipate some decrease in overall savings percentage with higher participation rates.
- Limited sample. Use literature values along with this information when evaluation customer water audits as a management strategy for other cities/WSCs.

Discussion Item

Process to Screen Water
Management Strategies

Screening Water Mgmt Strategies

- TWDB requires RWPG approval of process
- Region C has process in last round
- Previously sent to RWPG for comments
- Presented this meeting
- On website (www.regioncwater.org)
- RWPG and public comments welcome
- Seek RCWPG approval next meeting

Screening Water Mgmt Strategies

- Review the strategy categories mandated by the TWDB, as well as others identified by the consultants, RCWPG and the public
- Strategies will be presented by categories at a RCWPG meeting for review and input
- List of possible strategies in category
- Recommendation for potentially feasible strategies

Screening Water Mgmt Strategies

- Reasons for recommendations
- Seek approval of potential feasible list at next RCWPG meeting
- List of potentially feasible strategies can be amended at any time
- Potentially feasible strategies will be evaluated

Screening Water Mgmt Strategies

- General Guidelines for Feasible Strategies
 - Must have an identified sponsor or authority
 - Must consider the end use (includes water quality, distance to end use, etc.)
 - Should provide reasonable percentage of the projected need (except conservation, which will be evaluated for all needs)
 - Must meet existing federal and state regulations, including environmental regulations

Screening Water Mgmt Strategies

- Must be based on proven technology
- Must be politically acceptable
- Must be appropriate for regional water planning

Screening Water Mgmt Strategies

- TWDB Categories
 - Water conservation
 - Drought management measures
 - Wastewater reuse

Screening Water Mgmt Strategies

- Expanded use of existing supplies
 - Connection
 - System operation
 - Conjunctive use
 - Reallocation of storage
 - Voluntary redistribution of rights
 - Voluntary subordination of rights
 - Yield enhancement
 - Water quality improvement

Screening Water Mgmt Strategies

- New supply development
 - Surface water
 - Groundwater
 - Brush control
 - Precipitation enhancement
 - Desalination
 - Water right cancellation
 - Aquifer storage and recovery
- Interbasin transfers

Discussion Item

Update on Overall Status and
Next Steps

Newsletter

- The newsletter was published at the end of January
- The second newsletter for this year will likely be developed this summer

Public Comments

- Summary of public comments at the December 8 RCWPG meeting were emailed to the RCWPG in January and posted on website at www.regioncwater.org

Schedule

- February
 - Finalize water availability
 - Continue working on water conservation and reuse activities
 - Finalize analysis regarding impacts of recent droughts
 - Finalize scope and budget for RCWPG approval

Schedule

- Mail and post notice for March meeting to discuss and vote on supplemental funding scope and budget
- Finalize wholesale water provider list and submit to TWDB
- Finalize letter regarding instream flow analysis
- Submit recommended control points to TWDB WAM study

Schedule

- March Meeting
 - Seek approval supplemental funding
 - Seek approval of process to screen water management strategies
 - Discuss bay and estuary inflows
 - Discuss possible designation of unique stream segments

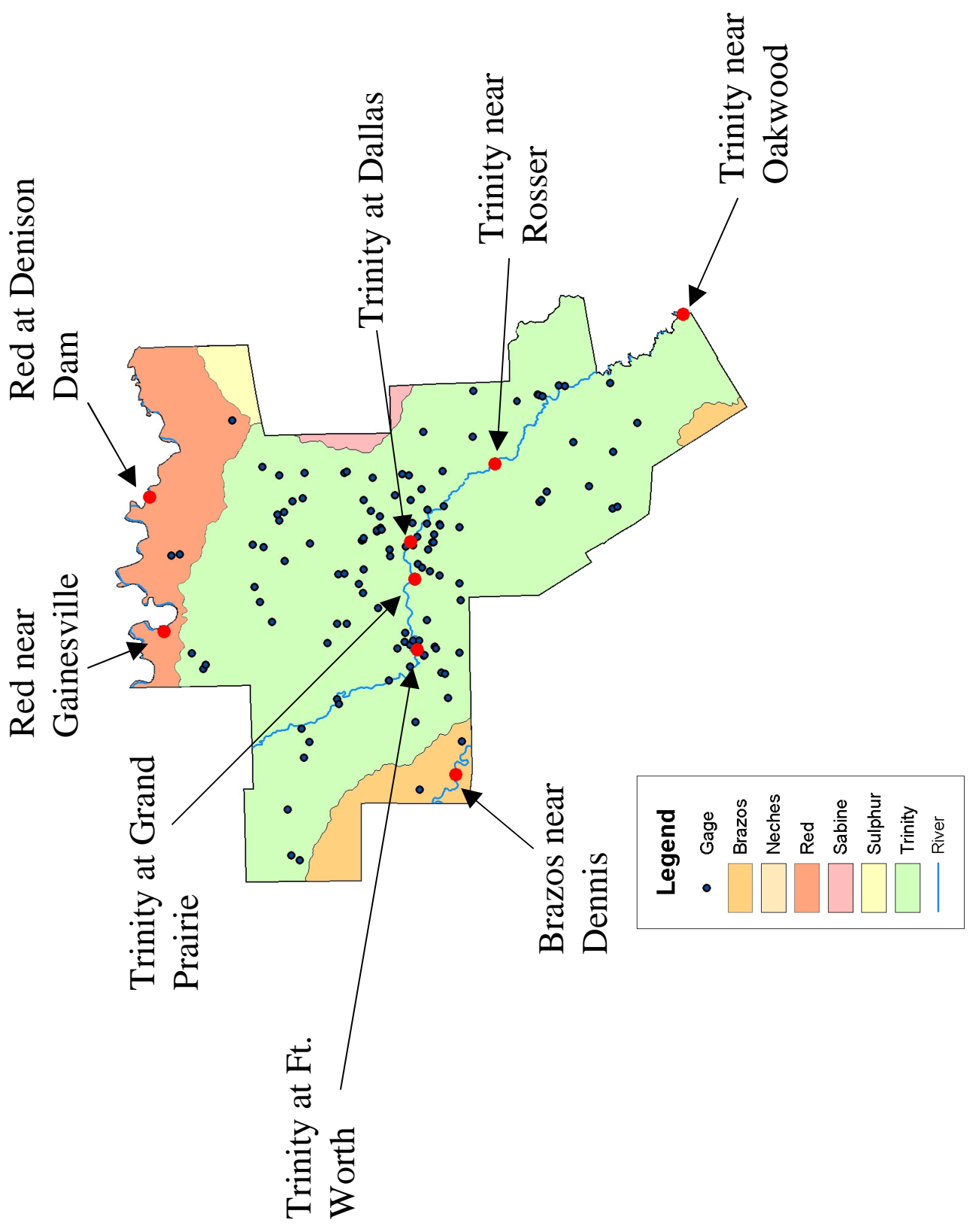
Action Item

Recommended Control points for
TWDB WAM Analysis

Recommended Control Points

- TWDB requests 3-5 control points per basin in each region
- Control points based on
 - Period of record
 - Location in the basin
 - Location of existing hydrologic features and diversions
 - Location of proposed strategies

Recommended Control Points



Recommended Control Points

- Trinity Basin
 - 8WFTW, West Fork of the Trinity River at Fort Worth (USGS 08048000)
 - 8WTGP, West Fork of the Trinity River at Grand Prairie (USGS 08049500)
 - 8TRDA, Trinity River at Dallas (USGS 08057000)
 - 8TRRS, Trinity River near Rosser (USGS 08062500)
 - 8TROA, Trinity River near Oakwood (USGS 08065000)

Recommended Control Points

- Red River Basin
 - V10000, Red River near Gainesville (USGS 07316000)
 - W10000, Red River at Denison Dam near Denison (USGS 07331600)
- Brazos River Basin
 - BRDE, Brazos River near Dennis (USGS 08090800)

Recommended Control Points

- Consultants seek RCWPG approval of these recommended control points to be submitted to the TWDB

Action Item

Surveys on Meeting Future Water
Needs

Surveys

- Consultants would like to survey the water user groups, wholesale water providers and county judges regarding the potential solutions to meet future water needs
- Goal of survey is to obtain information on planned projects to meet water supply needs
- Sample surveys provided

Surveys

- Consultants seek approval to send surveys at the end of February