

**Study 4**  
***Brazos G Activities in Support of Region C's  
Water Supply Study for Ellis, Johnson,  
Southern Dallas, and Southern Tarrant Counties  
(Four County Study)***

*Prepared for:*



*Prepared by:*



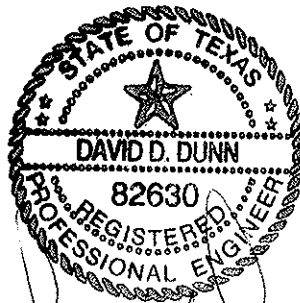
*With administration by:*

**Brazos River Authority**

April 2009



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**Southern Dallas, and Southern Tarrant Counties**  
**(Four County Study)**



4-28-2009

A handwritten signature in black ink, appearing to read "David D. Dunn".

**David D. Dunn, P.E.**



4-28-2009

A handwritten signature in black ink, appearing to read "Kristine Shaw".

**Kristine Shaw, P.E.**



## **Table of Contents**

<b><u>Section</u></b>	<b><u>Page</u></b>
Executive Summary .....	ES-1
1.0 Progress Report Summarizing Brazos G Activities .....	1
2.0 Study Results Summary .....	8

### **Attachments**

A	Raw Population and Water Demand Data
B-1	Selected Comments Provided to Region C in Response to Reviews Conducted by Brazos G Consultants
B-2	Interim Progress Report Update on Brazos G Activities in Support of Region C's Four County Water Supply Study
C	Population and Water Demand Projections for Johnson County Water Users
D	Current Water Supplies for Johnson County Water User Groups
E	Recommended Water Management Strategies for Johnson County Water User Groups
F	Comments from the Texas Water Development Board Regarding Phase I Reports and Responses from the Brazos G Regional Water Planning Group

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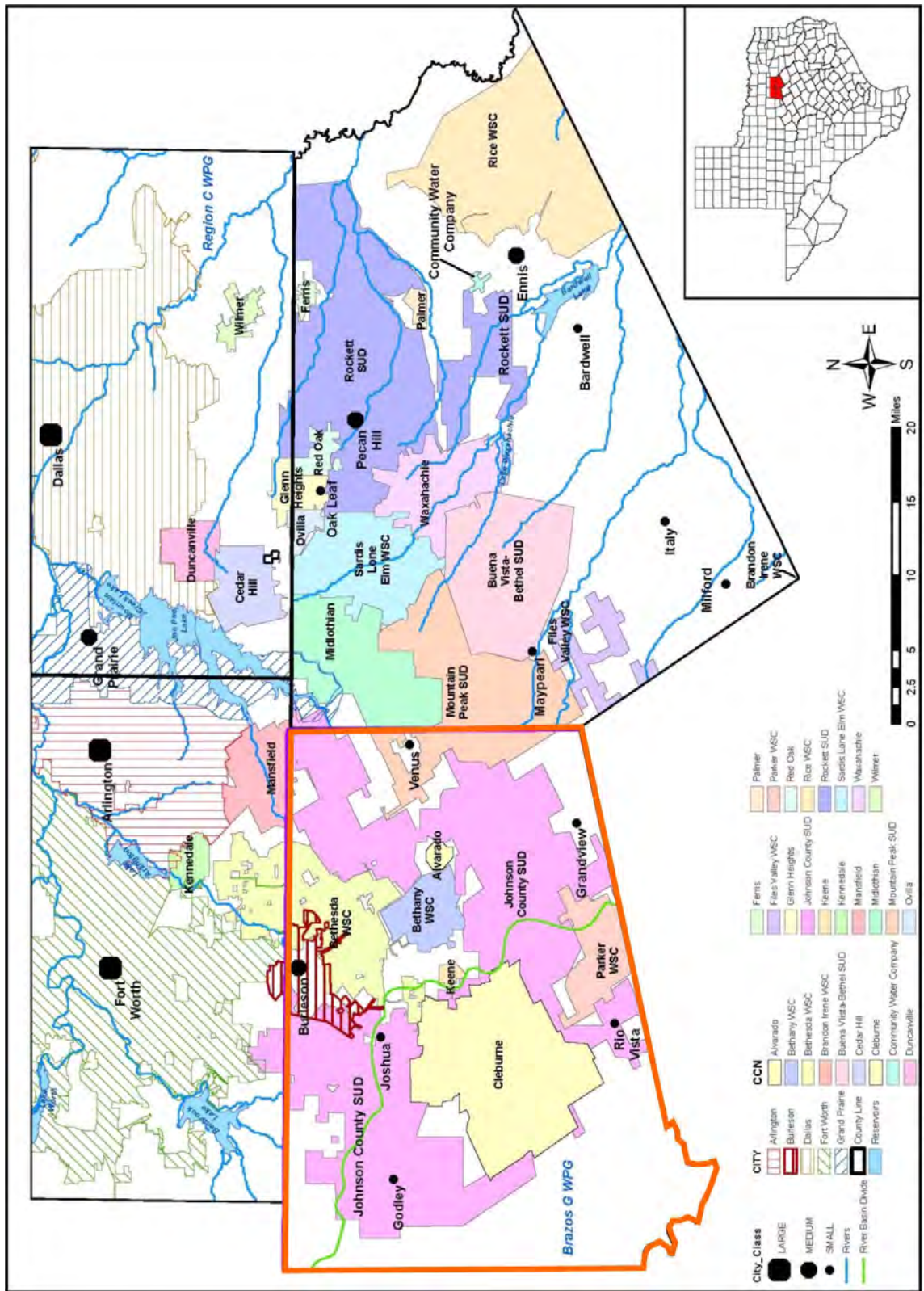
## ***Executive Summary***

After the Texas Water Development Board (TWDB) finalized population and water demand projections to be used in the preparation of the 2006 Brazos G and Region C Regional Water Plans, the North Texas Central Council of Government (NCTCOG) released population projections for the North Texas area which showed higher growth rates in several North Texas counties than previously estimated. Recent population estimates show that some North Texas counties are growing faster than projected in the regional plans but not as fast as projected by NCTCOG.<sup>1</sup> There has been substantial migration to suburban communities proximate to the Dallas-Fort Worth metropolitan area, which presents ever-changing population and water demand projections for the area. As growth in these more rural areas continues, local water supplies become more limited and regional water solutions become more attractive as options.

The Region C Regional Water Planning Group (Region C) and the Brazos G Regional Water Planning Group (Brazos G) have completed a study (Four County Study) that considers population and water demand growth for Ellis, Johnson, Southern Dallas, and Southern Tarrant Counties for the area shown in Figure ES-1. Based on the majority of the project area residing in Region C, Region C is preparing and submitting the report to guide the development of the 2011 Region C and Brazos G Plans with assistance from Brazos G specifically related to Johnson County entities located in the Brazos G Area. The purpose of this study is to review recent growth in the study area, make adjustments to population and demand projections to account for growth, and update the current and future water plans of the water user groups and wholesale water providers in the study area. This study included conducting meetings and compiling survey data provided by water suppliers regarding their current and future water plans, determining revisions to population and demand projections, and developing a water supply plan for the study area. This report describes the assistance provided by Brazos G to the study effort, and summarizes the information resulting from the study that is pertinent to the Brazos G Area. Those reading this summary should also consult the “Region C Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County,” which provides the full report and results of the Four County study.

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<sup>1</sup> Region C, Draft Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County, October 2008.



Source: Region C's Draft Water Supply Study for Ellis, Johnson, Southern Dallas, and Southern Tarrant Counties, November 2008.

Figure ES-1. Four County Study Area



The recommended changes from the 2006 Brazos G Plan for Johnson County include:

- Higher projections of population and water demand for water user groups in the study area, including higher projections provided by the City of Mansfield for their Johnson County growth as reallocated from previous Tarrant and Ellis County estimates,
- New water management strategies for Alvarado, Grand Prairie, and Johnson County Special Utility District (JCSUD),
- Arlington considers becoming a wholesale water provider, and
- Cost estimate updates for all water management strategies in the study area.

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## **1.0 Progress Report Summarizing Brazos G Activities**

The Region C Regional Water Planning Group (Region C) and the Brazos G Regional Water Planning Group (Brazos G) have completed a study (Four County Study) that considers population and water demand growth for Ellis, Johnson, Southern Dallas, and Southern Tarrant Counties for the area shown in Figure 1. From August 2007 to December 2008, the Brazos G consultants coordinated and assisted Region C in gathering Johnson County-specific water demand and supply information for Johnson County entities, developed water management strategies based on the 2006 Brazos G Plan and information provided by Johnson County water user groups, and assisted in the preparation of the draft Region C report summarizing results of the study. Tasks for which Brazos G consultants have provided assistance to Region C are summarized below.

August 2007 – Coordinated and assisted in developing meeting materials (agendas, water demand tables, graphs) for municipal water user groups in Johnson County based on information from the 2006 Brazos G Plan.

A review was conducted of recent water supply studies in the four-county area, with a primary emphasis on Johnson County entities. The overall message from the studies indicates that population and water demand projections are increasing at a faster pace than the Texas Water Development Board (TWDB) projections from the 2006 Plan. The City of Cleburne conducted a study<sup>1</sup> in May 2007 that showed that new industrial development and oil and gas exploration in the area have increased rapidly, which has led to increased water requirements. A study conducted by Johnson County Special Utility District (JCSUD)<sup>2</sup> showed substantially higher projected population and water demands in Year 2030 than TWDB estimates. The JCSUD study was used as a basis for recommending population and water demand updates, which show a 37% increase in projected population in Year 2030 and nearly 40% increase in projected Year 2030 water demands as compared to TWDB projections used in the 2006 Brazos G Plan. Since the 2006 Brazos G Plan, Johnson County Fresh Water Supply District No. 1 has merged with JCSUD and is shown accordingly in the Four County Study report. Additional

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<sup>1</sup> City of Cleburne and Freese and Nichols, "Cleburne Long-Range Water Supply Study- Draft", May 2007.

<sup>2</sup> Johnson County Special Utility District and HDR Engineering, Inc, "Evaluation of Additional Water Supplies from the Trinity and Brazos River Basins, December 2006.



studies in the area were reviewed and considered including: information from the City of Arlington regarding their wholesale water rate study, and a report developed jointly by the Brazos River Authority and Tarrant Regional Water District in April 2004 entitled "Regional Water Supply and Wastewater Service Study for Johnson and Parker County".

September 2007 – The Brazos G consultants, in a joint effort with Region C, met with the following seven Johnson County entities (from Sept 18-24, 2007) to discuss potential new water management strategies for Johnson County.

City of Alvarado	City of Mansfield
City of Burleson	Mountain Peak SUD
Bethesda WSC	City of Venus
Johnson County Special Utility District (JCSUD)	

During each meeting, the Brazos G and Region C consultants received feedback regarding current and planned water supplies, actual and historical water consumption, population (or connection) data, and future water demand estimates from the various entities' planning department to compare with TWDB population and water demand projections. Of the seven entities listed above, Bethesda Water Supply Corporation (WSC) and Mountain Peak Special Utility District (SUD) reported no updates. The other five entities (Alvarado, Burleson, JCSUD, Mansfield, and Venus) provided water planning projections based on current and historical usage that *are generally greater* than TWDB population and/or water demand projections. The raw population and water demand projections provided by Johnson County water entities is provided in Attachment A. Based on information provided by Johnson County water users, the recommended projections showed more than 100% increase for Mansfield and Venus, Alvarado, and Burleson as compared to TWDB estimates.

For other Johnson County entities that were not met with directly (and some Hill County water users located near Ellis County), the Brazos G consultants assisted Region C consultants in developing a Regional System Implementation Plan Survey. The survey requests system-specific information to include current and future population estimates, water demand projections, wholesale water supply contract information, and current and anticipated water supplies. A survey was sent to each of the following entities on October 16, 2007, requesting completed surveys to be returned by November 9, 2007.

Bethany WSC	City of Grandview
Brandon-Irene WSC (Hill County)	City of Joshua/ JCFWSD #1
City of Cleburne	City of Keene

Files Valley WSC (Hill County)  
City of Godley

Parker WSC (Hill/Johnson County)  
City of Rio Vista

Table 1 includes a list of Johnson County entities from which surveys were not returned. Meeting notes developed by the Region C consultants were reviewed by Brazos G consultants for comment prior to distributing to the respective Johnson County water users.

**Table 1.**  
**Johnson County Water Suppliers Contacted by Meetings or Survey**

<i>Entities Met with</i>	<i>Entities Surveyed – Responses Received</i>	<i>Entities Surveyed – No Response Received</i>
Alvarado	Bethany WSC	Godley
Bethesda WSC	Cleburne	Keene
Burleson	Grandview	
Johnson County SUD	Joshua	
Mansfield	Parker WSC	
Mountain Peak SUD	Rio Vista	
Venus		

October 2007 – Brazos G consultants provided water supply and water management strategy information to Region C consultants for Johnson County entities. Additional assistance was provided to clarify population, water demand, supplies for Johnson County water users.

November 2007 – Population and water demand projections based on local studies, meetings, or survey results were considered and population and water demands recommended by Region C were reviewed by Brazos G consultants for Johnson County entities prior to sending the draft results to water users. The population and water demand recommendations were reviewed for consistency with information provided by each of the Johnson County entities. In some cases, historical population and water use information was provided which was used to assess the reasonableness of extrapolating historical trends to future population and water demands projections (see Attachment A). Due to the large number of entities over the study area, there were numerous review processes required to ensure that the recommended population and water demand projections used in the study were consistent with the current trends that Johnson County entities are experiencing and their local plans. A copy of selected email correspondence from Brazos G consultants with comments and results of their reviews of Region C's interim analyses and reported results is presented in Attachment B-1.

December 2007 – The Brazos G consultants participated in a meeting on December 19, 2007 with Region C consultants and wholesale water suppliers to discuss interest in providing additional water supplies, and timing of new projects and infrastructure improvements.

February 2008 – A preliminary Population and Demand Projections Memo was developed by the Region C consultants and provided to the Brazos G consultants for review on February 14, 2007. The Brazos G consultants reviewed the preliminary draft report and provided comments. The Region C consultants addressed all comments.

May 2008 – A second draft Population and Demand Memo was reviewed by the Brazos G consultants in addition to providing clarification of future water management strategies for Johnson County entities. When more information was needed, the Brazos G consultants contacted Johnson County water users for clarification regarding future water supplies and timing of infrastructure projects. A third round of comments was provided and addressed in the final draft Population and Demand Projections Memo issued by the Region C consultants on May 22, 2008.

June 2008 – The Brazos G consultants provided technical assistance related to Johnson County water user groups as included in the draft report documenting the Four County Study. Information for Johnson County water management strategies was provided from recent water supply studies for Johnson County entities and the 2006 Brazos G Plan including: water treatment costs, infrastructure costs, and unit water costs. The Brazos G consultants provided assistance for consideration of groundwater projects identified by Johnson County water users during the November 2007 meetings or provided in survey responses.

July 2008 – The preliminary draft Four County Study Report was provided to the Brazos G consultants on July 3, 2008. The Brazos G consultants reviewed the draft report and provided comments to the Region C consultants. On July 22, 2008, the Brazos G consultants met with the Region C consultants, Tarrant Regional Water District (TRWD), and Trinity River Authority (TRA) to discuss comments on the preliminary draft Four County Study Report.

August 2008 – The Brazos G consultants began reviewing a second draft of the Four County Study Report provided on August 27, 2008. Additional information regarding costs of water management strategies was provided to the Region C consultants as needed.

September 2008 – The Brazos G consultants continued reviewing the second draft Four County Study Report provided on August 27, 2008. Several coordination phone calls with the Region C consultants were made for clarification of water management strategies and population

projections and water demands for Johnson County water user groups. On September 26, 2008, the Region C consultants sent the draft Four County Study Report to wholesale water providers (including the Brazos River Authority). An appendix with costs of water management strategies was provided.

October 2008 – The most recent draft Four County Study Report with associated appendices was reviewed by the Brazos G consultants. Several key wholesale water providers in Region C and Brazos G are also in the process of reviewing the draft Four County Study Report. On October 20, 2008, the Brazos G consultants attended a meeting with the Region C consultants and wholesale water providers to discuss their comments on the draft Four County Study Report. A status update of preliminary Four County Study Report results was provided at the Brazos G meeting on October 29, 2008 as provided in Attachment B-2, which also includes a comparison of interim recommended population and water demand projections to Brazos G 2006 Plan projections provided by the TWDB.

November to December 2008 – After addressing the comments from wholesale water groups and consultants, the Draft Four County Study Report was provided to the Brazos G RWPG and Johnson County municipal water user groups for review. In accordance with Regional Water Planning Guidelines, the Draft Four County Study Report was available for public review and comment at the Brazos G RWPG meeting held on December 3, 2008. There were no comments on the Four County Study provided at the Brazos G RWPG meeting. The Draft Four County Study Report was submitted by Region C on or before December 31, 2008.

A schedule of key project dates and a summary of Brazos G project involvement is provided in Figure 2.

January to February 2009 – The draft report was in the process of being reviewed by the TWDB. There was no Brazos G activity during this time.

March to April 2009 – The Brazos G consultant received comments from the TWDB on the draft study reports and prepared preliminary response which was considered by the Brazos G RWPG at their meeting on April 15, 2009. The Brazos G consultant prepared updates to the draft study reports and submitted the final study report to the TWDB by the April 30, 2009 deadline.



Four County Study Project Activities for Johnson County	Significant Project Milestones for Brazos G Project Involvement																	
	2007						2008											
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
Notice to Proceed on Project (Aug 14, 2007)	◆																	
Coordinate meeting and survey materials for Johnson County entities																		
Met with seven water user groups in Johnson County (Sept 18-24, 2007)		◆																
Water use surveys mailed (October 16, 2007)			◆															
Surveys received by November 9, 2007				◆														
Met with major wholesale water providers to discuss meeting and survey results (December 19, 2007)					◆													
Assisted in developing population and demand information for Johnson County entities for Region C's Population and Demand Memo (Draft- May 28, 2008)							◆											
Assisted with development of water management strategies for Johnson County entities																		
Provided assistance, review, and comment for Draft 4 County Study Report																		
Met with wholesale water providers to discuss initial draft 4 county report (July 22, 2008)																		
Will meet with TRWD, TRA, and Region C consultants to discuss Draft 4 county report (Oct 20, 2008)																		
Update to Brazos G RWPG (Oct 29, 2008)																		
Receive comments from Brazos G interests																		
Submit final, approved activity/coordination report to TWDB (Dec 31, 2008)																		

◆ (red): shows dates interim or internal drafts that were reviewed.  
 ◆ (black): shows dates of key events, deliverables or project meetings

Figure 2. Project Schedule

## **2.0 Study Results Summary**

The Draft Four County Study Report<sup>3</sup> after review by regional wholesale water providers, was posted to the Region C website on November 10, 2008, (<http://www.regioncwater.org/Documents/index.cfm>) for comment. A summary of tables and figures from the Draft Four County Study Report for Johnson County water users is provided in the attachments to this report. Attachment C presents population and water demand projections for Johnson County with a comparison to projections from the 2006 Brazos G Plan. A summary of existing water supplies is shown in Attachment D. Recommended water management strategies are included in Attachment E. Separate tables showing supply, demand, and water management strategies for Cleburne, JCSUD, and the Brazos River Authority are also included in Attachment E.

The recommended changes from the 2006 Brazos G Plan for Johnson County include:

- Higher projections of population and demand for water user groups in the study area, including higher projections provided by City of Mansfield for their Johnson County growth as reallocated from previous Tarrant and Ellis County estimates,
- New water management strategies for Alvarado, Grand Prairie, and JCSUD,
- Arlington considers becoming a wholesale water provider, and
- Cost estimate updates for all water management strategies in the study area.

TWDB comments on the draft report were provided to Brazos G and their consultant during March 2009. The Brazos G RWPG approved a set of responses to the TWDB comments for this study on April 15, 2009. A copy of the TWDB comments and summary of how comments were addressed in the final study report are provided in Attachment F.

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<sup>3</sup> Region C, Draft Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County, September 2008.

***Attachment A***  
***Raw Population and Water Demand Data***

(Provided by Johnson County Entities)



*Alvarado backing*

**CITY OF ALVARADO  
WATER REQUIREMENTS  
WITH REVISIONS TO BRAZOS G WPG  
ORIGINAL POPULATION ESTIMATES**

ORIGINAL POPULATION ESTIMATES	Historical		Projections					
	1990	2000	2010	2020	2030	2040	2050	2060
City of Alvarado	2,918	3,288	3,595	3,957	4,337	4,752	5,267	5,899
Alvarado (Brazos G) (Estimates are Incorrect)		12.7%	9.3%	10.1%	9.6%	9.6%	10.8%	12.0%

**Brazos G**

Per Capita Use Rates (gpc/d)	<u>2000</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>	<u>2060</u>
	125	121	117	115	112	111	111

**Brazos G**

Original DEMAND (acft)	460	487	519	559	596	655	733
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**Brazos G**

Projected Surplus (Shortage)	(401)	(433)	(473)	(510)	(569)	(647)
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REVISED City of Alvarado POPULATION ESTIMATES Revised, Based on NCTCOG SMOOTHED Est. Thru 2030 40-'60 using Brazos G %s	Historical		Projections					
	1990	2000	2010	2020	2030	2040	2050	2060
	2,918	3,288	4,439	7,535	10,766	11,800	13,074	14,643
		12.7%	9.3%	10.1%	9.6%	9.6%	10.8%	12.0%

REVISED DEMAND (acft)	460	602	988	1,387	1,480	1,626	1,821
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REVISED Projected Surplus (Shortage)	(516)	(902)	(1,301)	(1,394)	(1,540)	(1,735)
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Additional Ac Ft Shortage: (115) (469) (828) (884) (971) (1,088)

Alvarado, continued

Additions to Population:

Subdivision	Total	By Year													Ck. Fig
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
Lots	194	20	35	35	35	35	34								194
Stonegate Manor	140			30	30	30	30	20							140
Fox Hollow	350			50	50	50	50	50	50	50	50	50	50	50	350
Pace Communities	684	20	35	35	115	115	114	80	70	50	50	50	50	50	684

Household factor = 2.78

POPULATION INCREASE	Total Pop.:	By Year													Ck. Fig
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
Stonegate Manor	539	56	97	97	97	97	95	0	0	0	0	0	0	0	539
Fox Hollow	389	0	0	0	83	83	83	83	56	0	0	0	0	0	389
Pace Communities	973	0	0	0	139	139	139	139	139	139	139	139	139	0	973
<b>Total Pop.:</b>	<b>1902</b>	<b>56</b>	<b>97</b>	<b>97</b>	<b>320</b>	<b>320</b>	<b>317</b>	<b>222</b>	<b>195</b>	<b>139</b>	<b>139</b>	<b>139</b>	<b>139</b>	<b>0</b>	<b>1902</b>
		<b>56</b>			<b>'05-'10:</b>	<b>1151</b>			<b>'10-'15:</b>	<b>695</b>				<b>1902</b>	

**Water Consumption Since 2004**Burleson  
October 2007

	2004	2005	2006	2007
January	73,630,000	79,490,000	73,630,000	80,653,000
February	70,940,000	62,570,000	70,940,000	91,402,000
March	96,676,000	82,564,000	96,676,000	93,823,400
April	89,170,000	109,955,000	89,170,000	106,600,000
May	97,762,000	110,095,100	97,762,000	108,616,300
June	89,311,000	152,845,900	89,311,000	145,889,900
July	133,340,000	154,000,000	133,340,000	113,198,835
August	122,922,000	162,706,000	122,922,000	165,460,935
September	124,129,000	164,034,000	124,129,000	
October	89,484,000	144,233,900	89,484,000	
November	71,440,000	107,165,000	71,440,000	
December	75,333,000	87,420,000	75,333,000	
<b>Total</b>	<b>1,134,139,004</b>	<b>1,417,080,905</b>	<b>1,134,139,006</b>	<b>905,644,370</b>

## Number of Connections

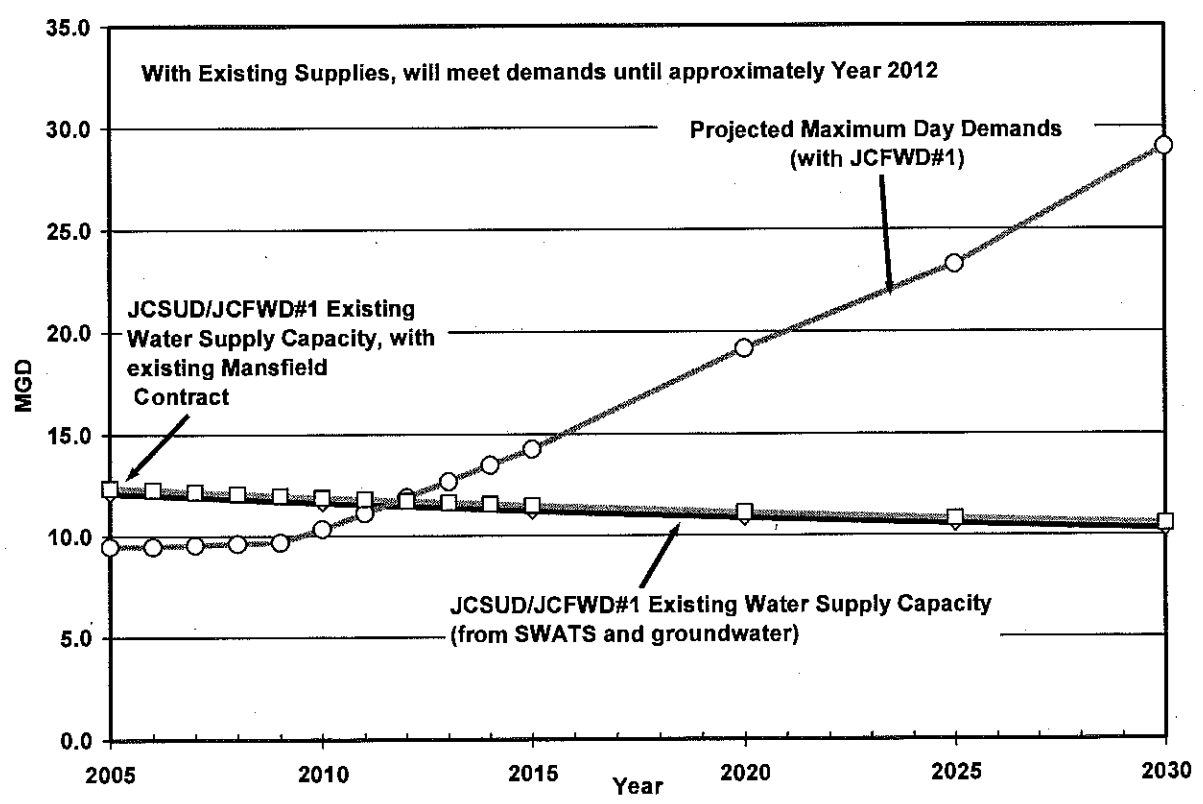
2004	9,626
2005	10,452
2006	11,159
2007	11,540

**Table 2-2.**  
**Estimated Connections and Maximum Water Demands from Year 2010 to 2030, for Combined JCSUD and JCFWD#1 System**

	2000	2005	2010	2015	2020	2025	2030
JCSUD + JCFWD#1							
# Households (Tarrant/Johnson/Ellis)	17,818	21,111	24,844	34,048	46,196	56,326	70,491
# Households (Hill)	75	78	81	104	125	159	255
# Households (Tarrant/Johnson/Ellis/Hill Total)	17,893	21,189	24,925	34,152	46,321	56,485	70,746
Est. Water Demand (MGD)	12.9	15.3	17.9	24.6	33.4	40.7	50.9
Prorate to Actual (2000-2005)		62.1%	56.0%	56.0%	56.0%	56.0%	56.0%
Revised Connections		13,149	14,358	19,810	26,625	32,317	40,303
Revised Max Water Demand (MGD)		9.5	10.3	14.3	19.2	23.3	29.0

\* Note: Hill County households were estimated based on growth trends in Johnson County districts near Hill County and CCN service area.

$\Sigma = 37484$        $\Sigma = 73218$        $\Sigma = 110833$



**Figure 2-2. Comparison of Existing Contracted Water Supplies to Projected Water Demands — JCSUD and JCFWD#1 Systems**

If 1.72 MGD from the City of Granbury SWATS interest is added to JCSUD/JCFWD#1 system, then supplies will meet demands until approximately Year 2014 (Figure 2-3).



Mansfield - Update sent by Bud Ertvin  
10/30/07

## City of Mansfield Population Growth Projection

Fiscal Year Ending 9/30/2007	New Single Family Homes	multiplier	Added Population	Projected Population	51,300 (1/1/2007)		Housing Unit Equivalents
					NCTCOG Projection	Projection	
				57,905			
2008	350	3.08	1,078	58,983	53,012	571	571
2009	350	3.08	1,078	60,061	54,724	571	571
2010	400	3.08	1,232	61,293	57,337	571	571
2011	400	3.08	1,232	62,525	60,488	1,050	1,050
2012	400	3.08	1,232	63,757	63,639	1,050	1,050
2013	400	3.08	1,232	64,989	66,790	1,050	1,050
2014	400	3.08	1,232	66,221	69,941	1,050	1,050
2015	500	3.08	1,540	67,761	73,094	1,050	1,050
2016	500	3.08	1,540	69,301	75,950	952	952
2017	500	3.08	1,540	70,841	78,806	952	952
2018	500	3.08	1,540	72,381	81,662	952	952
2019	500	3.08	1,540	73,921	84,518	952	952
2020	500	3.08	1,540	75,461	87,375	952	952
2021	500	3.08	1,540	77,001	89,802	809	809
2022	500	3.08	1,540	78,541	92,229	809	809
2023	500	3.08	1,540	80,081	94,656	809	809
2024	500	3.08	1,540	81,621	97,083	809	809
2025	500	3.08	1,540	83,161	99,512	809	809
2026	500	3.08	1,540	84,701	101,575	688	688
2027	500	3.08	1,540	86,241	103,638	688	688

Note: This is a working projection used for utility planning purposes. It has not been adopted by other departments of the city.

Mansfield, continued

### Projected Water Demand

Year	Projected Population	Residential Gallon Demand Per Capita	Mansfield Annual Avg. Day	Annual Mansfield Requirement	Max Day Multiplier	Mansfield		Grand Prairie Max Demand	J-County Max Demand	Total Capacity Needed
						Max Demand	Max Demand			
2006	54,856	198	10,861,488	3,964,443,120	1.8	19,550,678	0	0	0	19,550,678
2007	57,905	141	8,164,605	2,980,080,825	2.0	16,329,210	0	0	0	16,329,210
2008	58,983	196	11,560,668	4,219,643,820	2.3	26,820,750	400,000	0	0	27,220,750
2009	60,061	194	11,651,834	4,252,919,410	2.3	27,032,255	800,000	0	0	27,832,255
2010	61,293	192	11,768,256	<del>4,285,413,440</del>	2.3	27,302,354	1,100,000	0	0	28,402,354
2011	62,525	190	11,879,750	4,336,108,750	2.3	27,561,020	1,590,000	0	0	29,151,020
2012	63,757	188	11,986,316	4,375,005,340	2.3	27,808,253	2,180,000	300,000	300,000	30,288,253
2013	64,989	186	12,087,954	4,412,103,210	2.3	28,044,053	2,710,000	310,000	310,000	31,064,053
2014	66,221	184	12,184,664	4,447,402,360	2.3	28,268,420	3,280,000	320,000	320,000	31,868,420
2015	67,761	182	12,332,502	4,501,363,230	2.3	28,611,405	3,840,000	350,000	350,000	32,801,405
2016	69,301	180	12,474,180	4,553,075,700	2.3	28,940,098	4,410,000	380,000	380,000	33,730,098
2017	70,841	178	12,609,698	4,602,539,770	2.3	29,254,499	4,830,000	430,000	430,000	34,514,499
2018	72,381	176	12,739,056	4,649,755,440	2.3	29,554,610	5,110,000	500,000	500,000	35,164,610
2019	73,921	174	12,862,254	4,694,722,710	2.3	29,840,429	5,450,000	600,000	600,000	35,890,429
2020	75,461	172	12,979,292	<del>4,737,441,580</del>	2.3	30,111,957	5,780,000	730,000	730,000	36,621,957
2021	77,001	170	13,090,170	4,777,912,050	2.3	30,369,194	6,000,000	910,000	910,000	37,279,194
2022	78,541	168	13,194,888	4,816,134,120	2.3	30,612,140	6,000,000	1,170,000	1,170,000	37,782,140
2023	80,081	166	13,293,446	4,852,107,790	2.3	30,840,795	6,000,000	1,530,000	1,530,000	38,370,795
2024	81,621	164	13,385,844	4,885,833,060	2.3	31,055,158	6,000,000	2,060,000	2,060,000	39,115,158
2025	83,161	162	13,472,082	<del>4,917,309,930</del>	2.3	31,255,230	6,000,000	2,840,000	2,840,000	40,095,230
2026	84,701	160	13,552,160	4,946,538,400	2.3	31,441,011	6,000,000	4,010,000	4,010,000	41,451,011
2027	86,241	158	13,626,078	4,973,518,470	2.3	31,612,501	6,000,000	5,810,000	5,810,000	43,422,501

Mountain Peak SUD  
backup



FILE COPY

ROBERT T. CHILDRESS, JR., P.E. • BENJAMIN S. SHANKLIN, P.E. • ROBERT T. CHILDRESS III, P.E.

July 13, 2006

Mr. Robert G. Sokoll, City Manager  
City of Waxahachie  
P.O. Box 757  
Waxahachie, Texas 75168-0757

Re: Proposed Robert W. Sokoll  
Water Treatment Plant

Dear Mr. Sokoll:

This letter is in response to your July 3, 2006 letter on the above referenced Water Treatment Plant. We represent the following interested participants as their Engineer of Record:

Avalon Water and Sewer Service Corporation  
Buena Vista-Bethel Special Utility District  
Files Valley Water Supply Corporation  
Mountain Peak Special Utility District  
Rockett Special Utility District  
Sardis-Lone Elm Water Supply Corporation  
South Ellis County Water Supply Corporation

The Rockett S.U.D. currently serves the City of Ferris and the City of Palmer and we included their water use and demand projections in the attached tables.

The information you requested is as follows:

1. Each of the interested participants will forward a letter of intent under separate cover.
2. Attached is a composite service area map for each of the entities.
3. Water use and demand projections have been prepared and summarized in the attached tables.
4. Existing raw water rights in the Tarrant Regional Water District System are summarized as follows:

Avalon Water and Sewer Service Corporation	0.60 mgd
Buena Vista-Bethel Special Utility District	0.85 mgd
Boyce Water Supply Corporation	0.32 mgd
Bristol Water Supply Corporation	0.21 mgd
City of Ferris	0.72 mgd
City of Palmer	0.271 mgd
Rockett Special Utility District	5.52 mgd

5. Our address and contact information is shown on the letterhead.

Please advise if additional information is required on this matter

Very truly yours,

CHILDRESS ENGINEERS

Benjamin S. Shanklin, P.E.

BSS/sm

Encl.

cc: Terry Hafer, Rockett S.U.D.  
H. L. Southard, Avalon W.S.S.C.  
Joe Buchanan, Buena Vista-Bethel S.U.D.  
Debbie Cole, Files Valley W.S.C.  
Randy Kirk, Mountain Peak S.U.D.  
Paul Tischler, Sardis-Lone Elm W.S.C.  
Ray Loveless, South Ellis County W.S.C.  
David Bailey, City of Waxahachie  
Gary Hendricks, Birkhoff, Hendricks & Conway, LLP

ELLIS COUNTY			
NORTH WATER TREATMENT PLANT			
PEAK DEMAND PROJECTIONS (MGD)*			
Participant	2009	2020	2055
Rockett SUD	7.40	13.98	29.5
Mt. Peak SUD	0.18	1.87	7.63
Sardis-Lone Elm WSC	2.53	4.27	13.49
Ferris	0.70	0.72	1.37
Palmer	0.61	0.84	1.69

ELLIS COUNTY			
SOUTH WATER TREATMENT PLANT			
PEAK DEMAND PROJECTIONS (MGD)*			
Participant	2009	2020	2055
Avalon WSSC	0	0.39	0.78
Buena Vista-Bethel SUD	0.62	1.08	3.75
Files Valley WSC	0	0.14	1.41
South Ellis County WSC	0	0.25	1.07

\* THESE PROJECTIONS ARE NOT ALL INCLUSIVE AND DO NOT INCLUDE ALL PARTICIPANTS IN ELLIS COUNTY.

ELLIS COUNTY  
HILCO UNITED SERVICES  
AVALON WATER SUPPLY

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Demand (mgd)
2005	0.12	0.28	0.36	0
2009	0.13	0.31	0.36	0
2015	0.15	0.35	0.36	0
2016	0.15	0.36	0.18	0.18
2025	0.23	0.43	0	0.43
2050	0.38	0.71	0	0.71
2055	0.32	0.78	0	0.78

ELLIS COUNTY  
BUENA VISTA-BETHEL SPECIAL UTILITY DISTRICT

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	0.52	1.17	1.7	0
2009	0.04	1.32	0.7	0.62
2020	0.86	1.78	0.7	1.08
2035	1.23	2.54	0	2.54
2050	1.07	3.44	0	3.44
2055	1.82	3.75	0	3.75

ELLIS COUNTY  
BUENA VISTA-BETHEL SPECIAL UTILITY DISTRICT

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
	1994	640	0.28	0.26	0.6	0.55	0.61	0.54
1.56	1995	650	0.27	0.25	0.6	0.56	0.66	0.62
2.15	1996	664	0.29	0.28	0.6	0.57	0.66	0.63
2.26	1997	679	0.30	0.29	0.6	0.59	0.66	0.65
2.36	1998	695	0.38	0.38	0.6	0.60	0.66	0.66
12.66	1999	783	0.26	0.29	0.6	0.68	0.66	0.74
10.47	2000	865	0.26	0.32	0.6	0.75	0.66	0.82
9.25	2001	945	0.32	0.44	0.6	0.82	0.66	0.90
8.99	2002	1030	0.32	0.47	0.6	0.89	0.66	0.98
7.57	2003	1108	0.32	0.51	0.6	0.96	0.66	1.05
6.50	2004	1180	0.32	0.54	0.6	1.02	0.66	1.12
4.75	2005	1236	0.32	0.57	0.6	1.07	0.66	1.17
3.00	2006	1273	0.32	0.59	0.6	1.10	0.66	1.21
3.00	2007	1311	0.32	0.60	0.6	1.13	0.66	1.25
3.00	2008	1351	0.32	0.62	0.6	1.17	0.66	1.28
3.00	2009	1391	0.32	0.64	0.6	1.20	0.66	1.32
2.75	2010	1429	0.32	0.66	0.6	1.23	0.66	1.36
2.75	2011	1469	0.32	0.68	0.6	1.27	0.66	1.40
2.75	2012	1509	0.32	0.70	0.6	1.30	0.66	1.43
2.75	2013	1550	0.32	0.71	0.6	1.34	0.66	1.47
2.75	2014	1593	0.32	0.73	0.6	1.38	0.66	1.51
2.75	2015	1637	0.32	0.75	0.6	1.41	0.66	1.56
2.75	2016	1682	0.32	0.78	0.6	1.45	0.66	1.60
2.75	2017	1728	0.32	0.80	0.6	1.49	0.66	1.64
2.75	2018	1776	0.32	0.82	0.6	1.53	0.66	1.69
2.75	2019	1825	0.32	0.84	0.6	1.58	0.66	1.73
2.50	2020	1870	0.32	0.86	0.6	1.62	0.66	1.78
2.50	2021	1917	0.32	0.88	0.6	1.66	0.66	1.82
2.50	2022	1965	0.32	0.91	0.6	1.70	0.66	1.87
2.50	2023	2014	0.32	0.93	0.6	1.74	0.66	1.91
2.50	2024	2064	0.32	0.95	0.6	1.78	0.66	1.96
2.50	2025	2116	0.32	0.98	0.6	1.83	0.66	2.01
2.50	2026	2169	0.32	1.00	0.6	1.87	0.66	2.06
2.50	2027	2223	0.32	1.02	0.6	1.92	0.66	2.11
2.50	2028	2279	0.32	1.05	0.6	1.97	0.66	2.17
2.50	2029	2336	0.32	1.08	0.6	2.02	0.66	2.22
2.25	2030	2388	0.32	1.10	0.6	2.06	0.66	2.27
2.25	2031	2442	0.32	1.13	0.6	2.11	0.66	2.32
2.25	2032	2497	0.32	1.15	0.6	2.16	0.66	2.37
2.25	2033	2553	0.32	1.18	0.6	2.21	0.66	2.43
2.25	2034	2610	0.32	1.20	0.6	2.26	0.66	2.48
2.25	2035	2669	0.32	1.23	0.6	2.31	0.66	2.54
2.25	2036	2729	0.32	1.26	0.6	2.36	0.66	2.59
2.25	2037	2791	0.32	1.29	0.6	2.41	0.66	2.65
2.25	2038	2853	0.32	1.31	0.6	2.47	0.66	2.71
2.25	2039	2918	0.32	1.34	0.6	2.52	0.66	2.77
2.00	2040	2976	0.32	1.37	0.6	2.57	0.66	2.83
2.00	2041	3036	0.32	1.40	0.6	2.62	0.66	2.88
2.00	2042	3096	0.32	1.43	0.6	2.68	0.66	2.94
2.00	2043	3158	0.32	1.46	0.6	2.73	0.66	3.00
2.00	2044	3221	0.32	1.48	0.6	2.78	0.66	3.06
2.00	2045	3286	0.32	1.51	0.6	2.84	0.66	3.12
2.00	2046	3351	0.32	1.54	0.6	2.90	0.66	3.19
2.00	2047	3418	0.32	1.58	0.6	2.95	0.66	3.25
2.00	2048	3487	0.32	1.61	0.6	3.01	0.66	3.31
2.00	2049	3557	0.32	1.64	0.6	3.07	0.66	3.38
1.75	2050	3619	0.32	1.67	0.6	3.13	0.66	3.44
1.75	2051	3682	0.32	1.70	0.6	3.18	0.66	3.50
1.75	2052	3747	0.32	1.73	0.6	3.24	0.66	3.56
1.75	2053	3812	0.32	1.76	0.6	3.29	0.66	3.62
1.75	2054	3879	0.32	1.79	0.6	3.35	0.66	3.69
1.75	2055	3947	0.32	1.82	0.6	3.41	0.66	3.75



ELLIS COUNTY  
HILCO UNITED SERVICES  
AVALON WATER SUPPLY

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
2.0	2005	335	0.25	0.12	0.6	0.29	0.60	0.29
2.0	2006	342	0.32	0.16	0.6	0.30	0.60	0.30
2.0	2007	349	0.32	0.16	0.6	0.30	0.60	0.30
2.0	2008	356	0.32	0.16	0.6	0.31	0.60	0.31
2.0	2009	363	0.32	0.17	0.6	0.31	0.60	0.31
2.0	2010	370	0.32	0.17	0.6	0.32	0.60	0.32
2.0	2011	378	0.32	0.17	0.6	0.33	0.60	0.33
2.0	2012	385	0.32	0.18	0.6	0.33	0.60	0.33
2.0	2013	393	0.32	0.18	0.6	0.34	0.60	0.34
2.0	2014	401	0.32	0.18	0.6	0.35	0.60	0.35
2.0	2015	409	0.32	0.19	0.6	0.35	0.60	0.35
2.0	2016	417	0.32	0.19	0.6	0.36	0.60	0.36
2.0	2017	425	0.32	0.20	0.6	0.37	0.60	0.37
2.0	2018	434	0.32	0.20	0.6	0.37	0.60	0.37
2.0	2019	442	0.32	0.20	0.6	0.38	0.60	0.38
2.0	2020	451	0.32	0.21	0.6	0.39	0.60	0.39
2.0	2021	460	0.32	0.21	0.6	0.40	0.60	0.40
2.0	2022	469	0.32	0.22	0.6	0.41	0.60	0.41
2.0	2023	479	0.32	0.22	0.6	0.41	0.60	0.41
2.0	2024	488	0.32	0.23	0.6	0.42	0.60	0.42
2.0	2025	498	0.32	0.23	0.6	0.43	0.60	0.43
2.0	2026	508	0.32	0.23	0.6	0.44	0.60	0.44
2.0	2027	518	0.32	0.24	0.6	0.45	0.60	0.45
2.0	2028	529	0.32	0.24	0.6	0.46	0.60	0.46
2.0	2029	539	0.32	0.25	0.6	0.47	0.60	0.47
2.0	2030	550	0.32	0.25	0.6	0.48	0.60	0.48
2.0	2031	561	0.32	0.26	0.6	0.48	0.60	0.48
2.0	2032	572	0.32	0.26	0.6	0.49	0.60	0.49
2.0	2033	584	0.32	0.27	0.6	0.50	0.60	0.50
2.0	2034	595	0.32	0.27	0.6	0.51	0.60	0.51
2.0	2035	607	0.32	0.28	0.6	0.52	0.60	0.52
2.0	2036	619	0.32	0.29	0.6	0.54	0.60	0.54
2.0	2037	632	0.32	0.29	0.6	0.55	0.60	0.55
2.0	2038	645	0.32	0.30	0.6	0.56	0.60	0.56
2.0	2039	657	0.32	0.30	0.6	0.57	0.60	0.57
2.0	2040	671	0.32	0.31	0.6	0.58	0.60	0.58
2.0	2041	684	0.32	0.32	0.6	0.59	0.60	0.59
2.0	2042	698	0.32	0.32	0.6	0.60	0.60	0.60
2.0	2043	712	0.32	0.33	0.6	0.61	0.60	0.61
2.0	2044	726	0.32	0.33	0.6	0.63	0.60	0.63
2.0	2045	740	0.32	0.34	0.6	0.64	0.60	0.64
2.0	2046	755	0.32	0.35	0.6	0.65	0.60	0.65
2.0	2047	770	0.32	0.35	0.6	0.67	0.60	0.67
2.0	2048	786	0.32	0.36	0.6	0.68	0.60	0.68
2.0	2049	801	0.32	0.37	0.6	0.69	0.60	0.69
2.0	2050	817	0.32	0.38	0.6	0.71	0.60	0.71
2.0	2051	834	0.32	0.38	0.6	0.72	0.60	0.72
2.0	2052	850	0.32	0.39	0.6	0.73	0.60	0.73
2.0	2053	867	0.32	0.40	0.6	0.75	0.60	0.75
2.0	2054	885	0.32	0.41	0.6	0.76	0.60	0.76
2.0	2055	902	0.32	0.42	0.6	0.78	0.60	0.78

ELLIS COUNTY  
FILES VALLEY WATER SUPPLY CORPORATION

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Parker & Milford Contracts (mgd)	Aquilla WSD Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	0.47	0.94	0.375	1.5	0
2009	0.39	1.02	0.375	1.5	0
2020	0.48	1.26	0.375	1.5	0.14
2035	0.65	1.70	0.375	1.5	0.58
2050	0.88	2.29	0.375	1.5	1.17
2055	0.97	2.53	0.375	1.5	1.41

ELLIS COUNTY  
FILES VALLEY WATER SUPPLY CORPORATION

% Growth	Year	Total Conn. (Ea.)	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
2.00	2005	959	0.34	0.47	0.6	0.83	0.68	0.94
2.00	2006	978	0.26	0.37	0.6	0.85	0.68	0.96
2.00	2007	998	0.26	0.37	0.6	0.86	0.68	0.98
2.00	2008	1018	0.26	0.38	0.6	0.88	0.68	1.00
2.00	2009	1038	0.26	0.39	0.6	0.90	0.68	1.02
2.00	2010	1059	0.26	0.40	0.6	0.91	0.68	1.04
2.00	2011	1080	0.26	0.40	0.6	0.93	0.68	1.06
2.00	2012	1102	0.26	0.41	0.6	0.95	0.68	1.08
2.00	2013	1124	0.26	0.42	0.6	0.97	0.68	1.10
2.00	2014	1146	0.26	0.43	0.6	0.99	0.68	1.12
2.00	2015	1169	0.26	0.44	0.6	1.01	0.68	1.14
2.00	2016	1192	0.26	0.45	0.6	1.03	0.68	1.17
2.00	2017	1216	0.26	0.46	0.6	1.05	0.68	1.19
2.00	2018	1241	0.26	0.46	0.6	1.07	0.68	1.21
2.00	2019	1265	0.26	0.47	0.6	1.09	0.68	1.24
2.00	2020	1291	0.26	0.48	0.6	1.12	0.68	1.26
2.00	2021	1317	0.26	0.49	0.6	1.14	0.68	1.29
2.00	2022	1343	0.26	0.50	0.6	1.16	0.68	1.31
2.00	2023	1370	0.26	0.51	0.6	1.18	0.68	1.34
2.00	2024	1397	0.26	0.52	0.6	1.21	0.68	1.37
2.00	2025	1425	0.26	0.53	0.6	1.23	0.68	1.40
2.00	2026	1454	0.26	0.54	0.6	1.26	0.68	1.42
2.00	2027	1483	0.26	0.56	0.6	1.28	0.68	1.45
2.00	2028	1512	0.26	0.57	0.6	1.31	0.68	1.48
2.00	2029	1542	0.26	0.58	0.6	1.33	0.68	1.51
2.00	2030	1573	0.26	0.59	0.6	1.36	0.68	1.54
2.00	2031	1605	0.26	0.60	0.6	1.39	0.68	1.57
2.00	2032	1637	0.26	0.61	0.6	1.41	0.68	1.60
2.00	2033	1670	0.26	0.63	0.6	1.44	0.68	1.63
2.00	2034	1703	0.26	0.64	0.6	1.47	0.68	1.67
2.00	2035	1737	0.26	0.65	0.6	1.50	0.68	1.70
2.00	2036	1772	0.26	0.66	0.6	1.53	0.68	1.73
2.00	2037	1807	0.26	0.68	0.6	1.56	0.68	1.77
2.00	2038	1843	0.26	0.69	0.6	1.59	0.68	1.81
2.00	2039	1880	0.26	0.70	0.6	1.62	0.68	1.84
2.00	2040	1918	0.26	0.72	0.6	1.66	0.68	1.88
2.00	2041	1956	0.26	0.73	0.6	1.69	0.68	1.92
2.00	2042	1995	0.26	0.75	0.6	1.72	0.68	1.95
2.00	2043	2035	0.26	0.76	0.6	1.76	0.68	1.99
2.00	2044	2076	0.26	0.78	0.6	1.79	0.68	2.03
2.00	2045	2118	0.26	0.79	0.6	1.83	0.68	2.07
2.00	2046	2160	0.26	0.81	0.6	1.87	0.68	2.11
2.00	2047	2203	0.26	0.82	0.6	1.90	0.68	2.16
2.00	2048	2247	0.26	0.84	0.6	1.94	0.68	2.20
2.00	2049	2292	0.26	0.86	0.6	1.98	0.68	2.24
2.00	2050	2338	0.26	0.88	0.6	2.02	0.68	2.29
2.00	2051	2385	0.26	0.89	0.6	2.06	0.68	2.34
2.00	2052	2432	0.26	0.91	0.6	2.10	0.68	2.38
2.00	2053	2481	0.26	0.93	0.6	2.14	0.68	2.43
2.00	2054	2531	0.26	0.95	0.6	2.19	0.68	2.48
2.00	2055	2581	0.26	0.97	0.6	2.23	0.68	2.53

ELLIS COUNTY  
MOUNTAIN PEAK SPECIAL UTILITY DISTRICT

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Other Supplies (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	1.01	2.42	0.5	3.05	0
2009	1.26	3.00	0.8	2.11	0
2010	1.29	3.09	0.8	2.11	0.18
2012	1.37	3.28	0.8	2.00	0.48
2015	1.49	3.58	0.8	1.80	0.98
2017	1.58	3.78	1.0	1.60	1.18
2020	1.71	4.09	1.0	1.22	1.87
2035	2.44	5.83	1.0	0	4.83
2050	3.31	7.91	1.0	0	6.91
2055	3.60	8.63	1.0	0	7.63

ELLIS COUNTY  
MOUNTAIN PEAK SPECIAL UTILITY DISTRICT

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
0.82	1992	1110	0.28	0.45	0.6	0.96	0.67	1.07
4.23	1993	1157	0.28	0.47	0.6	1.00	0.67	1.12
4.49	1994	1209	0.28	0.49	0.6	1.04	0.67	1.17
7.70	1995	1263	0.28	0.51	0.6	1.09	0.67	1.22
7.76	1996	1361	0.28	0.55	0.6	1.18	0.67	1.31
13.45	1997	1544	0.28	0.62	0.6	1.33	0.67	1.49
6.15	1998	1639	0.28	0.66	0.6	1.42	0.67	1.58
8.78	1999	1783	0.28	0.72	0.6	1.54	0.67	1.72
10.47	2000	1970	0.28	0.79	0.6	1.70	0.67	1.90
9.25	2001	1916	0.28	0.77	0.6	1.66	0.67	1.85
8.99	2002	2088	0.28	0.84	0.6	1.80	0.67	2.01
7.57	2003	2246	0.28	0.91	0.6	1.94	0.67	2.17
6.50	2004	2392	0.28	0.96	0.6	2.07	0.67	2.31
4.75	2005	2506	0.28	1.01	0.6	2.17	0.67	2.42
3.25	2006	2828	0.28	1.14	0.6	2.44	0.67	2.73
3.25	2007	2920	0.28	1.18	0.6	2.52	0.67	2.82
3.25	2008	3015	0.28	1.22	0.6	2.60	0.67	2.91
3.25	2009	3113	0.28	1.26	0.6	2.69	0.67	3.00
3.00	2010	3206	0.28	1.29	0.6	2.77	0.67	3.09
3.00	2011	3302	0.28	1.33	0.6	2.85	0.67	3.19
3.00	2012	3401	0.28	1.37	0.6	2.94	0.67	3.28
3.00	2013	3503	0.28	1.41	0.6	3.03	0.67	3.38
3.00	2014	3609	0.28	1.45	0.6	3.12	0.67	3.48
2.75	2015	3708	0.28	1.49	0.6	3.20	0.67	3.58
2.75	2016	3810	0.28	1.54	0.6	3.29	0.67	3.68
2.75	2017	3915	0.28	1.58	0.6	3.38	0.67	3.78
2.75	2018	4022	0.28	1.62	0.6	3.48	0.67	3.88
2.75	2019	4133	0.28	1.67	0.6	3.57	0.67	3.99
2.50	2020	4236	0.28	1.71	0.6	3.66	0.67	4.09
2.50	2021	4342	0.28	1.75	0.6	3.75	0.67	4.19
2.50	2022	4451	0.28	1.79	0.6	3.85	0.67	4.29
2.50	2023	4562	0.28	1.84	0.6	3.94	0.67	4.40
2.50	2024	4676	0.28	1.89	0.6	4.04	0.67	4.51
2.50	2025	4793	0.28	1.93	0.6	4.14	0.67	4.62
2.50	2026	4913	0.28	1.98	0.6	4.24	0.67	4.74
2.50	2027	5035	0.28	2.03	0.6	4.35	0.67	4.86
2.50	2028	5161	0.28	2.08	0.6	4.46	0.67	4.98
2.50	2029	5290	0.28	2.13	0.6	4.57	0.67	5.10
2.25	2030	5409	0.28	2.18	0.6	4.67	0.67	5.22
2.25	2031	5531	0.28	2.23	0.6	4.78	0.67	5.34
2.25	2032	5656	0.28	2.28	0.6	4.89	0.67	5.46
2.25	2033	5783	0.28	2.33	0.6	5.00	0.67	5.58
2.25	2034	5913	0.28	2.38	0.6	5.11	0.67	5.70
2.25	2035	6046	0.28	2.44	0.6	5.22	0.67	5.83
2.25	2036	6182	0.28	2.49	0.6	5.34	0.67	5.96
2.25	2037	6321	0.28	2.55	0.6	5.46	0.67	6.10
2.25	2038	6463	0.28	2.61	0.6	5.58	0.67	6.24
2.25	2039	6609	0.28	2.66	0.6	5.71	0.67	6.38
2.00	2040	6741	0.28	2.72	0.6	5.82	0.67	6.50
2.00	2041	6876	0.28	2.77	0.6	5.94	0.67	6.63
2.00	2042	7013	0.28	2.83	0.6	6.06	0.67	6.77
2.00	2043	7153	0.28	2.88	0.6	6.18	0.67	6.90
2.00	2044	7297	0.28	2.94	0.6	6.30	0.67	7.04
2.00	2045	7442	0.28	3.00	0.6	6.43	0.67	7.18
2.00	2046	7591	0.28	3.06	0.6	6.56	0.67	7.32
2.00	2047	7743	0.28	3.12	0.6	6.69	0.67	7.47
2.00	2048	7898	0.28	3.18	0.6	6.82	0.67	7.62
2.00	2049	8056	0.28	3.25	0.6	6.96	0.67	7.77
1.75	2050	8197	0.28	3.31	0.6	7.08	0.67	7.91
1.75	2051	8340	0.28	3.36	0.6	7.21	0.67	8.05
1.75	2052	8486	0.28	3.42	0.6	7.33	0.67	8.19
1.75	2053	8635	0.28	3.48	0.6	7.46	0.67	8.33
1.75	2054	8786	0.28	3.54	0.6	7.59	0.67	8.48
1.75	2055	8940	0.28	3.60	0.6	7.72	0.67	8.63

ELLIS COUNTY  
ROCKETT SPECIAL UTILITY DISTRICT

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Other Supplies (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	3.87	8.94	5.5	0
2009	4.36	10.4	3.0	7.40
2020	5.86	13.98	0	13.98
2035	8.37	19.95	0	19.95
2050	11.34	27.05	0	27.05
2055	12.37	29.5	0	29.50

ELLIS COUNTY  
ROCKETT SPECIAL UTILITY DISTRICT

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day se per con (gpm/conn.)	Peak Demand (mgd)
2.34	1992	5695	0.26	2.13	0.6	4.92	0.62	5.08
9.27	1993	6223	0.26	2.33	0.6	5.38	0.62	5.56
10.72	1994	6890	0.26	2.58	0.6	5.95	0.62	6.15
1.28	1995	6978	0.26	2.61	0.6	6.03	0.62	6.23
4.33	1996	7280	0.26	2.73	0.6	6.29	0.62	6.50
4.40	1997	7601	0.26	2.85	0.6	6.57	0.62	6.79
4.12	1998	7914	0.26	2.96	0.6	6.84	0.62	7.07
5.46	1999	8346	0.26	3.12	0.6	7.21	0.62	7.45
6.51	2000	8889	0.26	3.33	0.6	7.68	0.62	7.94
0.60	2001	8943	0.26	3.35	0.6	7.73	0.62	7.98
4.14	2002	9313	0.26	3.49	0.6	8.05	0.62	8.31
4.05	2003	9690	0.26	3.63	0.6	8.37	0.62	8.65
3.49	2004	10028	0.26	3.75	0.6	8.66	0.62	8.95
3.19	2005	10348	0.26	3.87	0.6	8.94	0.62	9.24
3.00	2006	10659	0.26	3.99	0.6	9.21	0.62	9.52
3.00	2007	10978	0.26	4.11	0.6	9.49	0.62	9.80
3.00	2008	11308	0.26	4.23	0.6	9.77	0.62	10.10
3.00	2009	11647	0.26	4.36	0.6	10.06	0.62	10.40
2.75	2010	11967	0.26	4.48	0.6	10.34	0.62	10.68
2.75	2011	12296	0.26	4.60	0.6	10.62	0.62	10.98
2.75	2012	12634	0.26	4.73	0.6	10.92	0.62	11.28
2.75	2013	12982	0.26	4.86	0.6	11.22	0.62	11.59
2.75	2014	13339	0.26	4.99	0.6	11.52	0.62	11.91
2.75	2015	13706	0.26	5.13	0.6	11.84	0.62	12.24
2.75	2016	14083	0.26	5.27	0.6	12.17	0.62	12.57
2.75	2017	14470	0.26	5.42	0.6	12.50	0.62	12.92
2.75	2018	14868	0.26	5.57	0.6	12.85	0.62	13.27
2.75	2019	15277	0.26	5.72	0.6	13.20	0.62	13.64
2.50	2020	15659	0.26	5.86	0.6	13.53	0.62	13.98
2.50	2021	16050	0.26	6.01	0.6	13.87	0.62	14.33
2.50	2022	16451	0.26	6.16	0.6	14.21	0.62	14.69
2.50	2023	16863	0.26	6.31	0.6	14.57	0.62	15.05
2.50	2024	17284	0.26	6.47	0.6	14.93	0.62	15.43
2.50	2025	17716	0.26	6.63	0.6	15.31	0.62	15.82
2.50	2026	18159	0.26	6.80	0.6	15.69	0.62	16.21
2.50	2027	18613	0.26	6.97	0.6	16.08	0.62	16.62
2.50	2028	19078	0.26	7.14	0.6	16.48	0.62	17.03
2.50	2029	19555	0.26	7.32	0.6	16.90	0.62	17.46
2.25	2030	19995	0.26	7.49	0.6	17.28	0.62	17.85
2.25	2031	20445	0.26	7.65	0.6	17.66	0.62	18.25
2.25	2032	20905	0.26	7.83	0.6	18.06	0.62	18.66
2.25	2033	21376	0.26	8.00	0.6	18.47	0.62	19.08
2.25	2034	21857	0.26	8.18	0.6	18.88	0.62	19.51
2.25	2035	22348	0.26	8.37	0.6	19.31	0.62	19.95
2.25	2036	22851	0.26	8.56	0.6	19.74	0.62	20.40
2.25	2037	23365	0.26	8.75	0.6	20.19	0.62	20.86
2.25	2038	23891	0.26	8.94	0.6	20.64	0.62	21.33
2.25	2039	24429	0.26	9.15	0.6	21.11	0.62	21.81
2.00	2040	24917	0.26	9.33	0.6	21.53	0.62	22.25
2.00	2041	25416	0.26	9.52	0.6	21.96	0.62	22.69
2.00	2042	25924	0.26	9.71	0.6	22.40	0.62	23.14
2.00	2043	26442	0.26	9.90	0.6	22.85	0.62	23.61
2.00	2044	26971	0.26	10.10	0.6	23.30	0.62	24.08
2.00	2045	27511	0.26	10.30	0.6	23.77	0.62	24.56
2.00	2046	28061	0.26	10.51	0.6	24.24	0.62	25.05
2.00	2047	28622	0.26	10.72	0.6	24.73	0.62	25.55
2.00	2048	29194	0.26	10.93	0.6	25.22	0.62	26.06
2.00	2049	29778	0.26	11.15	0.6	25.73	0.62	26.59
1.75	2050	30299	0.26	11.34	0.6	26.18	0.62	27.05
1.75	2051	30830	0.26	11.54	0.6	26.64	0.62	27.52
1.75	2052	31369	0.26	11.74	0.6	27.10	0.62	28.01
1.75	2053	31918	0.26	11.95	0.6	27.58	0.62	28.50
1.75	2054	32477	0.26	12.16	0.6	28.06	0.62	29.00
1.75	2055	33045	0.26	12.37	0.6	28.55	0.62	29.50

ELLIS COUNTY  
SARDIS-LONE ELM WATER SUPPLY CORPORATION

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	1.73	4.13	3.73	0
2009	1.96	4.70	2.17	2.53
2020	2.67	6.39	2.17	4.27
2035	3.81	9.12	0	9.12
2050	5.17	12.37	0	12.37
2055	5.64	13.49	0	13.49



ELLIS COUNTY  
SARDIS-LONE ELM WATER SUPPLY CORPORATION

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day use per conn. (gpm/conn.)	Peak Demand (mgd)
2.94	1992	1783	0.28	0.72	0.6	1.54	0.67	1.72
3.81	1993	1851	0.28	0.75	0.6	1.60	0.67	1.79
4.43	1994	1933	0.28	0.78	0.6	1.67	0.67	1.86
5.54	1995	2040	0.28	0.82	0.6	1.76	0.67	1.97
6.76	1996	2178	0.28	0.88	0.6	1.88	0.67	2.10
8.68	1997	2367	0.28	0.95	0.6	2.05	0.67	2.28
7.14	1998	2536	0.28	1.02	0.6	2.19	0.67	2.45
7.02	1999	2714	0.28	1.09	0.6	2.34	0.67	2.62
10.47	2000	2998	0.28	1.21	0.6	2.59	0.67	2.89
9.25	2001	3275	0.28	1.32	0.6	2.83	0.67	3.16
8.99	2002	3570	0.28	1.44	0.6	3.08	0.67	3.44
7.57	2003	3840	0.28	1.55	0.6	3.32	0.67	3.71
6.50	2004	4090	0.28	1.65	0.6	3.53	0.67	3.95
4.75	2005	4284	0.28	1.73	0.6	3.70	0.67	4.13
3.25	2006	4423	0.28	1.78	0.6	3.82	0.67	4.27
3.25	2007	4567	0.28	1.84	0.6	3.95	0.67	4.41
3.25	2008	4715	0.28	1.90	0.6	4.07	0.67	4.55
3.25	2009	4869	0.28	1.96	0.6	4.21	0.67	4.70
3.00	2010	5015	0.28	2.02	0.6	4.33	0.67	4.84
3.00	2011	5165	0.28	2.08	0.6	4.46	0.67	4.98
3.00	2012	5320	0.28	2.15	0.6	4.60	0.67	5.13
3.00	2013	5480	0.28	2.21	0.6	4.73	0.67	5.29
3.00	2014	5644	0.28	2.28	0.6	4.88	0.67	5.45
2.75	2015	5799	0.28	2.34	0.6	5.01	0.67	5.60
2.75	2016	5959	0.28	2.40	0.6	5.15	0.67	5.75
2.75	2017	6123	0.28	2.47	0.6	5.29	0.67	5.91
2.75	2018	6291	0.28	2.54	0.6	5.44	0.67	6.07
2.75	2019	6464	0.28	2.61	0.6	5.59	0.67	6.24
2.50	2020	6626	0.28	2.67	0.6	5.72	0.67	6.39
2.50	2021	6791	0.28	2.74	0.6	5.87	0.67	6.55
2.50	2022	6961	0.28	2.81	0.6	6.01	0.67	6.72
2.50	2023	7135	0.28	2.88	0.6	6.16	0.67	6.88
2.50	2024	7314	0.28	2.95	0.6	6.32	0.67	7.06
2.50	2025	7496	0.28	3.02	0.6	6.48	0.67	7.23
2.50	2026	7684	0.28	3.10	0.6	6.64	0.67	7.41
2.50	2027	7876	0.28	3.18	0.6	6.80	0.67	7.60
2.50	2028	8073	0.28	3.25	0.6	6.97	0.67	7.79
2.50	2029	8275	0.28	3.34	0.6	7.15	0.67	7.98
2.25	2030	8461	0.28	3.41	0.6	7.31	0.67	8.16
2.25	2031	8651	0.28	3.49	0.6	7.47	0.67	8.35
2.25	2032	8846	0.28	3.57	0.6	7.64	0.67	8.53
2.25	2033	9045	0.28	3.65	0.6	7.81	0.67	8.73
2.25	2034	9248	0.28	3.73	0.6	7.99	0.67	8.92
2.25	2035	9456	0.28	3.81	0.6	8.17	0.67	9.12
2.25	2036	9669	0.28	3.90	0.6	8.35	0.67	9.33
2.25	2037	9887	0.28	3.99	0.6	8.54	0.67	9.54
2.25	2038	10109	0.28	4.08	0.6	8.73	0.67	9.75
2.25	2039	10337	0.28	4.17	0.6	8.93	0.67	9.97
2.00	2040	10543	0.28	4.25	0.6	9.11	0.67	10.17
2.00	2041	10754	0.28	4.34	0.6	9.29	0.67	10.38
2.00	2042	10969	0.28	4.42	0.6	9.48	0.67	10.58
2.00	2043	11189	0.28	4.51	0.6	9.67	0.67	10.79
2.00	2044	11413	0.28	4.60	0.6	9.86	0.67	11.01
2.00	2045	11641	0.28	4.69	0.6	10.06	0.67	11.23
2.00	2046	11874	0.28	4.79	0.6	10.26	0.67	11.46
2.00	2047	12111	0.28	4.88	0.6	10.46	0.67	11.68
2.00	2048	12353	0.28	4.98	0.6	10.67	0.67	11.92
2.00	2049	12600	0.28	5.08	0.6	10.89	0.67	12.16
1.75	2050	12821	0.28	5.17	0.6	11.08	0.67	12.37
1.75	2051	13045	0.28	5.26	0.6	11.27	0.67	12.59
1.75	2052	13274	0.28	5.35	0.6	11.47	0.67	12.81
1.75	2053	13506	0.28	5.45	0.6	11.67	0.67	13.03
1.75	2054	13742	0.28	5.54	0.6	11.87	0.67	13.26
1.75	2055	13983	0.28	5.64	0.6	12.08	0.67	13.49

ELLIS COUNTY SOUTH ELLIS COUNTY WATER SUPPLY CORPORATION				
	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	0.14	0.39	0.63	0
2009	0.15	0.43	0.60	0
2010	0.16	0.44	0.39	0.05
2020	0.19	0.55	0.30	0.25
2035	0.26	0.72	0	0.72
2050	0.34	0.97	0	0.97
2055	0.38	1.07	0	1.07

ELLIS COUNTY  
SOUTH ELLIS COUNTY WATER SUPPLY CORPORATION

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
	2005	441	0.22	0.14	0.6	0.38	0.62	0.39
2.95	2006	454	0.22	0.14	0.6	0.39	0.62	0.41
2.00	2007	463	0.22	0.15	0.6	0.40	0.62	0.41
2.00	2008	472	0.22	0.15	0.6	0.41	0.62	0.42
2.00	2009	482	0.22	0.15	0.6	0.42	0.62	0.43
2.00	2010	491	0.22	0.16	0.6	0.42	0.62	0.44
2.00	2011	501	0.22	0.16	0.6	0.43	0.62	0.45
2.00	2012	511	0.22	0.16	0.6	0.44	0.62	0.46
2.00	2013	522	0.22	0.17	0.6	0.45	0.62	0.47
2.00	2014	532	0.22	0.17	0.6	0.46	0.62	0.47
2.00	2015	543	0.22	0.17	0.6	0.47	0.62	0.48
2.00	2016	553	0.22	0.18	0.6	0.48	0.62	0.49
2.00	2017	564	0.22	0.18	0.6	0.49	0.62	0.50
2.00	2018	576	0.22	0.18	0.6	0.50	0.62	0.51
2.00	2019	587	0.22	0.19	0.6	0.51	0.62	0.52
2.00	2020	599	0.22	0.19	0.6	0.52	0.62	0.53
2.00	2021	611	0.22	0.19	0.6	0.53	0.62	0.55
2.00	2022	623	0.22	0.20	0.6	0.54	0.62	0.56
2.00	2023	636	0.22	0.20	0.6	0.55	0.62	0.57
2.00	2024	648	0.22	0.21	0.6	0.56	0.62	0.58
2.00	2025	661	0.22	0.21	0.6	0.57	0.62	0.59
2.00	2026	675	0.22	0.21	0.6	0.58	0.62	0.60
2.00	2027	688	0.22	0.22	0.6	0.59	0.62	0.61
2.00	2028	702	0.22	0.22	0.6	0.61	0.62	0.63
2.00	2029	716	0.22	0.23	0.6	0.62	0.62	0.64
2.00	2030	730	0.22	0.23	0.6	0.63	0.62	0.65
2.00	2031	745	0.22	0.24	0.6	0.64	0.62	0.66
2.00	2032	760	0.22	0.24	0.6	0.66	0.62	0.68
2.00	2033	775	0.22	0.25	0.6	0.67	0.62	0.69
2.00	2034	790	0.22	0.25	0.6	0.68	0.62	0.71
2.00	2035	806	0.22	0.26	0.6	0.70	0.62	0.72
2.00	2036	822	0.22	0.26	0.6	0.71	0.62	0.73
2.00	2037	839	0.22	0.27	0.6	0.72	0.62	0.75
2.00	2038	856	0.22	0.27	0.6	0.74	0.62	0.76
2.00	2039	873	0.22	0.28	0.6	0.75	0.62	0.78
2.00	2040	890	0.22	0.28	0.6	0.77	0.62	0.79
2.00	2041	908	0.22	0.29	0.6	0.78	0.62	0.81
2.00	2042	926	0.22	0.29	0.6	0.80	0.62	0.83
2.00	2043	945	0.22	0.30	0.6	0.82	0.62	0.84
2.00	2044	964	0.22	0.31	0.6	0.83	0.62	0.86
2.00	2045	983	0.22	0.31	0.6	0.85	0.62	0.88
2.00	2046	1002	0.22	0.32	0.6	0.87	0.62	0.89
2.00	2047	1022	0.22	0.32	0.6	0.88	0.62	0.91
2.00	2048	1043	0.22	0.33	0.6	0.90	0.62	0.93
2.00	2049	1064	0.22	0.34	0.6	0.92	0.62	0.95
2.00	2050	1085	0.22	0.34	0.6	0.94	0.62	0.97
2.00	2051	1107	0.22	0.35	0.6	0.96	0.62	0.99
2.00	2052	1129	0.22	0.36	0.6	0.98	0.62	1.01
2.00	2053	1151	0.22	0.36	0.6	0.99	0.62	1.03
2.00	2054	1175	0.22	0.37	0.6	1.01	0.62	1.05
2.00	2055	1198	0.22	0.38	0.6	1.04	0.62	1.07

ELLIS COUNTY			
NORTH WATER TREATMENT PLANT			
PEAK DEMAND PROJECTIONS (MGD)*			
Participant	2009	2020	2055
Rockett SUD	7.40	13.98	29.5
Mt. Peak SUD	0.18	1.87	7.63
Sardis-Lone Elm WSC	2.53	4.27	13.49
Ferris	0.70	0.72	1.37
Palmer	0.61	0.84	1.69

ELLIS COUNTY			
SOUTH WATER TREATMENT PLANT			
PEAK DEMAND PROJECTIONS (MGD)*			
Participant	2009	2020	2055
Avalon WSSC	0	0.39	0.78
Buena Vista-Bethel SUD	0.62	1.08	3.75
Files Valley WSC	0	0.14	1.41
South Ellis County WSC	0	0.25	1.07

\* THESE PROJECTIONS ARE NOT ALL INCLUSIVE AND DO NOT INCLUDE ALL PARTICIPANTS IN ELLIS COUNTY.

ELLIS COUNTY  
HILCO UNITED SERVICES  
AVALON WATER SUPPLY

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Demand (mgd)
2005	0.12	0.28	0.36	0
2009	0.13	0.31	0.36	0
2015	0.15	0.35	0.36	0
2016	0.15	0.36	0.18	0.18
2025	0.23	0.43	0	0.43
2050	0.38	0.71	0	0.71
2055	0.32	0.78	0	0.78

ELLIS COUNTY  
HILCO UNITED SERVICES  
AVALON WATER SUPPLY

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
2.0	2005	335	0.25	0.12	0.6	0.29	0.60	0.29
2.0	2006	342	0.32	0.16	0.6	0.30	0.60	0.30
2.0	2007	349	0.32	0.16	0.6	0.30	0.60	0.30
2.0	2008	356	0.32	0.16	0.6	0.31	0.60	0.31
2.0	2009	363	0.32	0.17	0.6	0.31	0.60	0.31
2.0	2010	370	0.32	0.17	0.6	0.32	0.60	0.32
2.0	2011	378	0.32	0.17	0.6	0.33	0.60	0.33
2.0	2012	385	0.32	0.18	0.6	0.33	0.60	0.33
2.0	2013	393	0.32	0.18	0.6	0.34	0.60	0.34
2.0	2014	401	0.32	0.18	0.6	0.35	0.60	0.35
2.0	2015	409	0.32	0.19	0.6	0.35	0.60	0.35
2.0	2016	417	0.32	0.19	0.6	0.36	0.60	0.36
2.0	2017	425	0.32	0.20	0.6	0.37	0.60	0.37
2.0	2018	434	0.32	0.20	0.6	0.37	0.60	0.37
2.0	2019	442	0.32	0.20	0.6	0.38	0.60	0.38
2.0	2020	451	0.32	0.21	0.6	0.39	0.60	0.39
2.0	2021	460	0.32	0.21	0.6	0.40	0.60	0.40
2.0	2022	469	0.32	0.22	0.6	0.41	0.60	0.41
2.0	2023	479	0.32	0.22	0.6	0.41	0.60	0.41
2.0	2024	488	0.32	0.23	0.6	0.42	0.60	0.42
2.0	2025	498	0.32	0.23	0.6	0.43	0.60	0.43
2.0	2026	508	0.32	0.23	0.6	0.44	0.60	0.44
2.0	2027	518	0.32	0.24	0.6	0.45	0.60	0.45
2.0	2028	529	0.32	0.24	0.6	0.46	0.60	0.46
2.0	2029	539	0.32	0.25	0.6	0.47	0.60	0.47
2.0	2030	550	0.32	0.25	0.6	0.48	0.60	0.48
2.0	2031	561	0.32	0.26	0.6	0.48	0.60	0.48
2.0	2032	572	0.32	0.26	0.6	0.49	0.60	0.49
2.0	2033	584	0.32	0.27	0.6	0.50	0.60	0.50
2.0	2034	595	0.32	0.27	0.6	0.51	0.60	0.51
2.0	2035	607	0.32	0.28	0.6	0.52	0.60	0.52
2.0	2036	619	0.32	0.29	0.6	0.54	0.60	0.54
2.0	2037	632	0.32	0.29	0.6	0.55	0.60	0.55
2.0	2038	645	0.32	0.30	0.6	0.56	0.60	0.56
2.0	2039	657	0.32	0.30	0.6	0.57	0.60	0.57
2.0	2040	671	0.32	0.31	0.6	0.58	0.60	0.58
2.0	2041	684	0.32	0.32	0.6	0.59	0.60	0.59
2.0	2042	698	0.32	0.32	0.6	0.60	0.60	0.60
2.0	2043	712	0.32	0.33	0.6	0.61	0.60	0.61
2.0	2044	726	0.32	0.33	0.6	0.63	0.60	0.63
2.0	2045	740	0.32	0.34	0.6	0.64	0.60	0.64
2.0	2046	755	0.32	0.35	0.6	0.65	0.60	0.65
2.0	2047	770	0.32	0.35	0.6	0.67	0.60	0.67
2.0	2048	786	0.32	0.36	0.6	0.68	0.60	0.68
2.0	2049	801	0.32	0.37	0.6	0.69	0.60	0.69
2.0	2050	817	0.32	0.38	0.6	0.71	0.60	0.71
2.0	2051	834	0.32	0.38	0.6	0.72	0.60	0.72
2.0	2052	850	0.32	0.39	0.6	0.73	0.60	0.73
2.0	2053	867	0.32	0.40	0.6	0.75	0.60	0.75
2.0	2054	885	0.32	0.41	0.6	0.76	0.60	0.76
2.0	2055	902	0.32	0.42	0.6	0.78	0.60	0.78

ELLIS COUNTY  
BUENA VISTA-BETHEL SPECIAL UTILITY DISTRICT

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	0.52	1.17	1.7	0
2009	0.04	1.32	0.7	0.62
2020	0.86	1.78	0.7	1.08
2035	1.23	2.54	0	2.54
2050	1.07	3.44	0	3.44
2055	1.82	3.75	0	3.75

ELLIS COUNTY  
BUENA VISTA-BETHEL SPECIAL UTILITY DISTRICT

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
	1994	640	0.28	0.26	0.6	0.55	0.61	0.54
1.56	1995	650	0.27	0.25	0.6	0.56	0.66	0.62
2.15	1996	664	0.29	0.28	0.6	0.57	0.66	0.63
2.26	1997	679	0.30	0.29	0.6	0.59	0.66	0.65
2.36	1998	695	0.38	0.38	0.6	0.60	0.66	0.66
12.66	1999	783	0.26	0.29	0.6	0.68	0.66	0.74
10.47	2000	865	0.26	0.32	0.6	0.75	0.66	0.82
9.25	2001	945	0.32	0.44	0.6	0.82	0.66	0.90
8.99	2002	1030	0.32	0.47	0.6	0.89	0.66	0.98
7.57	2003	1108	0.32	0.51	0.6	0.96	0.66	1.05
6.50	2004	1180	0.32	0.54	0.6	1.02	0.66	1.12
4.75	2005	1236	0.32	0.57	0.6	1.07	0.66	1.17
3.00	2006	1273	0.32	0.59	0.6	1.10	0.66	1.21
3.00	2007	1311	0.32	0.60	0.6	1.13	0.66	1.25
3.00	2008	1351	0.32	0.62	0.6	1.17	0.66	1.28
3.00	2009	1391	0.32	0.64	0.6	1.20	0.66	1.32
2.75	2010	1429	0.32	0.66	0.6	1.23	0.66	1.36
2.75	2011	1469	0.32	0.68	0.6	1.27	0.66	1.40
2.75	2012	1509	0.32	0.70	0.6	1.30	0.66	1.43
2.75	2013	1550	0.32	0.71	0.6	1.34	0.66	1.47
2.75	2014	1593	0.32	0.73	0.6	1.38	0.66	1.51
2.75	2015	1637	0.32	0.75	0.6	1.41	0.66	1.56
2.75	2016	1682	0.32	0.78	0.6	1.45	0.66	1.60
2.75	2017	1728	0.32	0.80	0.6	1.49	0.66	1.64
2.75	2018	1776	0.32	0.82	0.6	1.53	0.66	1.69
2.75	2019	1825	0.32	0.84	0.6	1.58	0.66	1.73
2.50	2020	1870	0.32	0.86	0.6	1.62	0.66	1.78
2.50	2021	1917	0.32	0.88	0.6	1.66	0.66	1.82
2.50	2022	1965	0.32	0.91	0.6	1.70	0.66	1.87
2.50	2023	2014	0.32	0.93	0.6	1.74	0.66	1.91
2.50	2024	2064	0.32	0.95	0.6	1.78	0.66	1.96
2.50	2025	2116	0.32	0.98	0.6	1.83	0.66	2.01
2.50	2026	2169	0.32	1.00	0.6	1.87	0.66	2.06
2.50	2027	2223	0.32	1.02	0.6	1.92	0.66	2.11
2.50	2028	2279	0.32	1.05	0.6	1.97	0.66	2.17
2.50	2029	2336	0.32	1.08	0.6	2.02	0.66	2.22
2.25	2030	2388	0.32	1.10	0.6	2.06	0.66	2.27
2.25	2031	2442	0.32	1.13	0.6	2.11	0.66	2.32
2.25	2032	2497	0.32	1.15	0.6	2.16	0.66	2.37
2.25	2033	2553	0.32	1.18	0.6	2.21	0.66	2.43
2.25	2034	2610	0.32	1.20	0.6	2.26	0.66	2.48
2.25	2035	2669	0.32	1.23	0.6	2.31	0.66	2.54
2.25	2036	2729	0.32	1.26	0.6	2.36	0.66	2.59
2.25	2037	2791	0.32	1.29	0.6	2.41	0.66	2.65
2.25	2038	2853	0.32	1.31	0.6	2.47	0.66	2.71
2.25	2039	2918	0.32	1.34	0.6	2.52	0.66	2.77
2.00	2040	2976	0.32	1.37	0.6	2.57	0.66	2.83
2.00	2041	3036	0.32	1.40	0.6	2.62	0.66	2.88
2.00	2042	3096	0.32	1.43	0.6	2.68	0.66	2.94
2.00	2043	3158	0.32	1.46	0.6	2.73	0.66	3.00
2.00	2044	3221	0.32	1.48	0.6	2.78	0.66	3.06
2.00	2045	3286	0.32	1.51	0.6	2.84	0.66	3.12
2.00	2046	3351	0.32	1.54	0.6	2.90	0.66	3.19
2.00	2047	3418	0.32	1.58	0.6	2.95	0.66	3.25
2.00	2048	3487	0.32	1.61	0.6	3.01	0.66	3.31
2.00	2049	3557	0.32	1.64	0.6	3.07	0.66	3.38
1.75	2050	3619	0.32	1.67	0.6	3.13	0.66	3.44
1.75	2051	3682	0.32	1.70	0.6	3.18	0.66	3.50
1.75	2052	3747	0.32	1.73	0.6	3.24	0.66	3.56
1.75	2053	3812	0.32	1.76	0.6	3.29	0.66	3.62
1.75	2054	3879	0.32	1.79	0.6	3.35	0.66	3.69
1.75	2055	3947	0.32	1.82	0.6	3.41	0.66	3.75



ELLIS COUNTY FILES VALLEY WATER SUPPLY CORPORATION					
	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Parker & Milford Contracts (mgd)	Aquilla WSD Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	0.47	0.94	0.375	1.5	0
2009	0.39	1.02	0.375	1.5	0
2020	0.48	1.26	0.375	1.5	0.14
2035	0.65	1.70	0.375	1.5	0.58
2050	0.88	2.29	0.375	1.5	1.17
2055	0.97	2.53	0.375	1.5	1.41

ELLIS COUNTY  
FILES VALLEY WATER SUPPLY CORPORATION

% Growth	Year	Total Conn. (Ea.)	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
2.00	2005	959	0.34	0.47	0.6	0.83	0.68	0.94
2.00	2006	978	0.26	0.37	0.6	0.85	0.68	0.96
2.00	2007	998	0.26	0.37	0.6	0.86	0.68	0.98
2.00	2008	1018	0.26	0.38	0.6	0.88	0.68	1.00
2.00	2009	1038	0.26	0.39	0.6	0.90	0.68	1.02
2.00	2010	1059	0.26	0.40	0.6	0.91	0.68	1.04
2.00	2011	1080	0.26	0.40	0.6	0.93	0.68	1.06
2.00	2012	1102	0.26	0.41	0.6	0.95	0.68	1.08
2.00	2013	1124	0.26	0.42	0.6	0.97	0.68	1.10
2.00	2014	1146	0.26	0.43	0.6	0.99	0.68	1.12
2.00	2015	1169	0.26	0.44	0.6	1.01	0.68	1.14
2.00	2016	1192	0.26	0.45	0.6	1.03	0.68	1.17
2.00	2017	1216	0.26	0.46	0.6	1.05	0.68	1.19
2.00	2018	1241	0.26	0.46	0.6	1.07	0.68	1.21
2.00	2019	1265	0.26	0.47	0.6	1.09	0.68	1.24
2.00	2020	1291	0.26	0.48	0.6	1.12	0.68	1.26
2.00	2021	1317	0.26	0.49	0.6	1.14	0.68	1.29
2.00	2022	1343	0.26	0.50	0.6	1.16	0.68	1.31
2.00	2023	1370	0.26	0.51	0.6	1.18	0.68	1.34
2.00	2024	1397	0.26	0.52	0.6	1.21	0.68	1.37
2.00	2025	1425	0.26	0.53	0.6	1.23	0.68	1.40
2.00	2026	1454	0.26	0.54	0.6	1.26	0.68	1.42
2.00	2027	1483	0.26	0.56	0.6	1.28	0.68	1.45
2.00	2028	1512	0.26	0.57	0.6	1.31	0.68	1.48
2.00	2029	1542	0.26	0.58	0.6	1.33	0.68	1.51
2.00	2030	1573	0.26	0.59	0.6	1.36	0.68	1.54
2.00	2031	1605	0.26	0.60	0.6	1.39	0.68	1.57
2.00	2032	1637	0.26	0.61	0.6	1.41	0.68	1.60
2.00	2033	1670	0.26	0.63	0.6	1.44	0.68	1.63
2.00	2034	1703	0.26	0.64	0.6	1.47	0.68	1.67
2.00	2035	1737	0.26	0.65	0.6	1.50	0.68	1.70
2.00	2036	1772	0.26	0.66	0.6	1.53	0.68	1.73
2.00	2037	1807	0.26	0.68	0.6	1.56	0.68	1.77
2.00	2038	1843	0.26	0.69	0.6	1.59	0.68	1.81
2.00	2039	1880	0.26	0.70	0.6	1.62	0.68	1.84
2.00	2040	1918	0.26	0.72	0.6	1.66	0.68	1.88
2.00	2041	1956	0.26	0.73	0.6	1.69	0.68	1.92
2.00	2042	1995	0.26	0.75	0.6	1.72	0.68	1.95
2.00	2043	2035	0.26	0.76	0.6	1.76	0.68	1.99
2.00	2044	2076	0.26	0.78	0.6	1.79	0.68	2.03
2.00	2045	2118	0.26	0.79	0.6	1.83	0.68	2.07
2.00	2046	2160	0.26	0.81	0.6	1.87	0.68	2.11
2.00	2047	2203	0.26	0.82	0.6	1.90	0.68	2.16
2.00	2048	2247	0.26	0.84	0.6	1.94	0.68	2.20
2.00	2049	2292	0.26	0.86	0.6	1.98	0.68	2.24
2.00	2050	2338	0.26	0.88	0.6	2.02	0.68	2.29
2.00	2051	2385	0.26	0.89	0.6	2.06	0.68	2.34
2.00	2052	2432	0.26	0.91	0.6	2.10	0.68	2.38
2.00	2053	2481	0.26	0.93	0.6	2.14	0.68	2.43
2.00	2054	2531	0.26	0.95	0.6	2.19	0.68	2.48
2.00	2055	2581	0.26	0.97	0.6	2.23	0.68	2.53

ELLIS COUNTY  
MOUNTAIN PEAK SPECIAL UTILITY DISTRICT

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Other Supplies (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	1.01	2.42	0.5	3.05	0
2009	1.26	3.00	0.8	2.11	0
2010	1.29	3.09	0.8	2.11	0.18
2012	1.37	3.28	0.8	2.00	0.48
2015	1.49	3.58	0.8	1.80	0.98
2017	1.58	3.78	1.0	1.60	1.18
2020	1.71	4.09	1.0	1.22	1.87
2035	2.44	5.83	1.0	0	4.83
2050	3.31	7.91	1.0	0	6.91
2055	3.60	8.63	1.0	0	7.63

ELLIS COUNTY  
MOUNTAIN PEAK SPECIAL UTILITY DISTRICT

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
0.82	1992	1110	0.28	0.45	0.6	0.96	0.67	1.07
4.23	1993	1157	0.28	0.47	0.6	1.00	0.67	1.12
4.49	1994	1209	0.28	0.49	0.6	1.04	0.67	1.17
7.70	1995	1263	0.28	0.51	0.6	1.09	0.67	1.22
7.76	1996	1361	0.28	0.55	0.6	1.18	0.67	1.31
13.45	1997	1544	0.28	0.62	0.6	1.33	0.67	1.49
6.15	1998	1639	0.28	0.66	0.6	1.42	0.67	1.58
8.78	1999	1783	0.28	0.72	0.6	1.54	0.67	1.72
10.47	2000	1970	0.28	0.79	0.6	1.70	0.67	1.90
9.25	2001	1916	0.28	0.77	0.6	1.66	0.67	1.85
8.99	2002	2088	0.28	0.84	0.6	1.80	0.67	2.01
7.57	2003	2246	0.28	0.91	0.6	1.94	0.67	2.17
6.50	2004	2392	0.28	0.96	0.6	2.07	0.67	2.31
4.75	2005	2506	0.28	1.01	0.6	2.17	0.67	2.42
3.25	2006	2828	0.28	1.14	0.6	2.44	0.67	2.73
3.25	2007	2920	0.28	1.18	0.6	2.52	0.67	2.82
3.25	2008	3015	0.28	1.22	0.6	2.60	0.67	2.91
3.25	2009	3113	0.28	1.26	0.6	2.69	0.67	3.00
3.00	2010	3206	0.28	1.29	0.6	2.77	0.67	3.09
3.00	2011	3302	0.28	1.33	0.6	2.85	0.67	3.19
3.00	2012	3401	0.28	1.37	0.6	2.94	0.67	3.28
3.00	2013	3503	0.28	1.41	0.6	3.03	0.67	3.38
3.00	2014	3609	0.28	1.45	0.6	3.12	0.67	3.48
2.75	2015	3708	0.28	1.49	0.6	3.20	0.67	3.58
2.75	2016	3810	0.28	1.54	0.6	3.29	0.67	3.68
2.75	2017	3915	0.28	1.58	0.6	3.38	0.67	3.78
2.75	2018	4022	0.28	1.62	0.6	3.48	0.67	3.88
2.75	2019	4133	0.28	1.67	0.6	3.57	0.67	3.99
2.50	2020	4236	0.28	1.71	0.6	3.66	0.67	4.09
2.50	2021	4342	0.28	1.75	0.6	3.75	0.67	4.19
2.50	2022	4451	0.28	1.79	0.6	3.85	0.67	4.29
2.50	2023	4562	0.28	1.84	0.6	3.94	0.67	4.40
2.50	2024	4676	0.28	1.89	0.6	4.04	0.67	4.51
2.50	2025	4793	0.28	1.93	0.6	4.14	0.67	4.62
2.50	2026	4913	0.28	1.98	0.6	4.24	0.67	4.74
2.50	2027	5035	0.28	2.03	0.6	4.35	0.67	4.86
2.50	2028	5161	0.28	2.08	0.6	4.46	0.67	4.98
2.50	2029	5290	0.28	2.13	0.6	4.57	0.67	5.10
2.25	2030	5409	0.28	2.18	0.6	4.67	0.67	5.22
2.25	2031	5531	0.28	2.23	0.6	4.78	0.67	5.34
2.25	2032	5656	0.28	2.28	0.6	4.89	0.67	5.46
2.25	2033	5783	0.28	2.33	0.6	5.00	0.67	5.58
2.25	2034	5913	0.28	2.38	0.6	5.11	0.67	5.70
2.25	2035	6046	0.28	2.44	0.6	5.22	0.67	5.83
2.25	2036	6182	0.28	2.49	0.6	5.34	0.67	5.96
2.25	2037	6321	0.28	2.55	0.6	5.46	0.67	6.10
2.25	2038	6463	0.28	2.61	0.6	5.58	0.67	6.24
2.25	2039	6609	0.28	2.66	0.6	5.71	0.67	6.38
2.00	2040	6741	0.28	2.72	0.6	5.82	0.67	6.50
2.00	2041	6876	0.28	2.77	0.6	5.94	0.67	6.63
2.00	2042	7013	0.28	2.83	0.6	6.06	0.67	6.77
2.00	2043	7153	0.28	2.88	0.6	6.18	0.67	6.90
2.00	2044	7297	0.28	2.94	0.6	6.30	0.67	7.04
2.00	2045	7442	0.28	3.00	0.6	6.43	0.67	7.18
2.00	2046	7591	0.28	3.06	0.6	6.56	0.67	7.32
2.00	2047	7743	0.28	3.12	0.6	6.69	0.67	7.47
2.00	2048	7898	0.28	3.18	0.6	6.82	0.67	7.62
2.00	2049	8056	0.28	3.25	0.6	6.96	0.67	7.77
1.75	2050	8197	0.28	3.31	0.6	7.08	0.67	7.91
1.75	2051	8340	0.28	3.36	0.6	7.21	0.67	8.05
1.75	2052	8486	0.28	3.42	0.6	7.33	0.67	8.19
1.75	2053	8635	0.28	3.48	0.6	7.46	0.67	8.33
1.75	2054	8786	0.28	3.54	0.6	7.59	0.67	8.48
1.75	2055	8940	0.28	3.60	0.6	7.72	0.67	8.63

ELLIS COUNTY  
ROCKETT SPECIAL UTILITY DISTRICT

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Other Supplies (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	3.87	8.94	5.5	0
2009	4.36	10.4	3.0	7.40
2020	5.86	13.98	0	13.98
2035	8.37	19.95	0	19.95
2050	11.34	27.05	0	27.05
2055	12.37	29.5	0	29.50

ELLIS COUNTY  
ROCKETT SPECIAL UTILITY DISTRICT

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. 'gpm/conn.	Req. Supply (mgd)	Peak Day se per con 'gpm/conn.	Peak Demand (mgd)
2.34	1992	5695	0.26	2.13	0.6	4.92	0.62	5.08
9.27	1993	6223	0.26	2.33	0.6	5.38	0.62	5.56
10.72	1994	6890	0.26	2.58	0.6	5.95	0.62	6.15
1.28	1995	6978	0.26	2.61	0.6	6.03	0.62	6.23
4.33	1996	7280	0.26	2.73	0.6	6.29	0.62	6.50
4.40	1997	7601	0.26	2.85	0.6	6.57	0.62	6.79
4.12	1998	7914	0.26	2.96	0.6	6.84	0.62	7.07
5.46	1999	8346	0.26	3.12	0.6	7.21	0.62	7.45
6.51	2000	8889	0.26	3.33	0.6	7.88	0.62	7.94
0.60	2001	8943	0.26	3.35	0.6	7.73	0.62	7.98
4.14	2002	9313	0.26	3.49	0.6	8.05	0.62	8.31
4.05	2003	9690	0.26	3.63	0.6	8.37	0.62	8.65
3.49	2004	10028	0.26	3.75	0.6	8.66	0.62	8.95
3.19	2005	10348	0.26	3.87	0.6	8.94	0.62	9.24
3.00	2006	10659	0.26	3.99	0.6	9.21	0.62	9.52
3.00	2007	10978	0.26	4.11	0.6	9.49	0.62	9.80
3.00	2008	11308	0.26	4.23	0.6	9.77	0.62	10.10
3.00	2009	11647	0.26	4.36	0.6	10.06	0.62	10.40
2.75	2010	11967	0.26	4.48	0.6	10.34	0.62	10.68
2.75	2011	12296	0.26	4.60	0.6	10.62	0.62	10.98
2.75	2012	12634	0.26	4.73	0.6	10.92	0.62	11.28
2.75	2013	12982	0.26	4.86	0.6	11.22	0.62	11.59
2.75	2014	13339	0.26	4.99	0.6	11.52	0.62	11.91
2.75	2015	13706	0.26	5.13	0.6	11.84	0.62	12.24
2.75	2016	14083	0.26	5.27	0.6	12.17	0.62	12.57
2.75	2017	14470	0.26	5.42	0.6	12.50	0.62	12.92
2.75	2018	14868	0.26	5.57	0.6	12.85	0.62	13.27
2.75	2019	15277	0.26	5.72	0.6	13.20	0.62	13.64
2.50	2020	15659	0.26	5.86	0.6	13.53	0.62	13.98
2.50	2021	16050	0.26	6.01	0.6	13.87	0.62	14.33
2.50	2022	16451	0.26	6.16	0.6	14.21	0.62	14.69
2.50	2023	16863	0.26	6.31	0.6	14.57	0.62	15.05
2.50	2024	17284	0.26	6.47	0.6	14.93	0.62	15.43
2.50	2025	17716	0.26	6.63	0.6	15.31	0.62	15.82
2.50	2026	18159	0.26	6.80	0.6	15.69	0.62	16.21
2.50	2027	18613	0.26	6.97	0.6	16.08	0.62	16.62
2.50	2028	19078	0.26	7.14	0.6	16.48	0.62	17.03
2.50	2029	19555	0.26	7.32	0.6	16.90	0.62	17.46
2.25	2030	19995	0.26	7.49	0.6	17.28	0.62	17.85
2.25	2031	20445	0.26	7.65	0.6	17.66	0.62	18.25
2.25	2032	20905	0.26	7.83	0.6	18.06	0.62	18.66
2.25	2033	21376	0.26	8.00	0.6	18.47	0.62	19.08
2.25	2034	21857	0.26	8.18	0.6	18.88	0.62	19.51
2.25	2035	22348	0.26	8.37	0.6	19.31	0.62	19.95
2.25	2036	22851	0.26	8.56	0.6	19.74	0.62	20.40
2.25	2037	23365	0.26	8.75	0.6	20.19	0.62	20.86
2.25	2038	23891	0.26	8.94	0.6	20.64	0.62	21.33
2.25	2039	24429	0.26	9.15	0.6	21.11	0.62	21.81
2.00	2040	24917	0.26	9.33	0.6	21.53	0.62	22.25
2.00	2041	25416	0.26	9.52	0.6	21.96	0.62	22.69
2.00	2042	25924	0.26	9.71	0.6	22.40	0.62	23.14
2.00	2043	26442	0.26	9.90	0.6	22.85	0.62	23.61
2.00	2044	26971	0.26	10.10	0.6	23.30	0.62	24.08
2.00	2045	27511	0.26	10.30	0.6	23.77	0.62	24.56
2.00	2046	28061	0.26	10.51	0.6	24.24	0.62	25.05
2.00	2047	28622	0.26	10.72	0.6	24.73	0.62	25.55
2.00	2048	29194	0.26	10.93	0.6	25.22	0.62	26.06
2.00	2049	29778	0.26	11.15	0.6	25.73	0.62	26.59
1.75	2050	30299	0.26	11.34	0.6	26.18	0.62	27.05
1.75	2051	30830	0.26	11.54	0.6	26.64	0.62	27.52
1.75	2052	31369	0.26	11.74	0.6	27.10	0.62	28.01
1.75	2053	31918	0.26	11.95	0.6	27.58	0.62	28.50
1.75	2054	32477	0.26	12.16	0.6	28.06	0.62	29.00
1.75	2055	33045	0.26	12.37	0.6	28.55	0.62	29.50

ELLIS COUNTY  
SARDIS-LONE ELM WATER SUPPLY CORPORATION

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	1.73	4.13	3.73	0
2009	1.96	4.70	2.17	2.53
2020	2.67	6.39	2.17	4.27
2035	3.81	9.12	0	9.12
2050	5.17	12.37	0	12.37
2055	5.64	13.49	0	13.49

ELLIS COUNTY  
SARDIS-LONE ELM WATER SUPPLY CORPORATION

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day se per con (gpm/conn.)	Peak Demand (mgd)
2.94	1992	1783	0.28	0.72	0.6	1.54	0.67	1.72
3.81	1993	1851	0.28	0.75	0.6	1.60	0.67	1.79
4.43	1994	1933	0.28	0.78	0.6	1.67	0.67	1.86
5.54	1995	2040	0.28	0.82	0.6	1.76	0.67	1.97
6.76	1996	2178	0.28	0.88	0.6	1.88	0.67	2.10
8.68	1997	2367	0.28	0.95	0.6	2.05	0.67	2.28
7.14	1998	2536	0.28	1.02	0.6	2.19	0.67	2.45
7.02	1999	2714	0.28	1.09	0.6	2.34	0.67	2.62
10.47	2000	2998	0.28	1.21	0.6	2.59	0.67	2.89
9.25	2001	3275	0.28	1.32	0.6	2.83	0.67	3.16
8.99	2002	3570	0.28	1.44	0.6	3.08	0.67	3.44
7.57	2003	3840	0.28	1.55	0.6	3.32	0.67	3.71
6.50	2004	4090	0.28	1.65	0.6	3.53	0.67	3.95
4.75	2005	4284	0.28	1.73	0.6	3.70	0.67	4.13
3.25	2006	4423	0.28	1.78	0.6	3.82	0.67	4.27
3.25	2007	4567	0.28	1.84	0.6	3.95	0.67	4.41
3.25	2008	4715	0.28	1.90	0.6	4.07	0.67	4.55
3.25	2009	4869	0.28	1.96	0.6	4.21	0.67	4.70
3.00	2010	5015	0.28	2.02	0.6	4.33	0.67	4.84
3.00	2011	5165	0.28	2.08	0.6	4.46	0.67	4.98
3.00	2012	5320	0.28	2.15	0.6	4.60	0.67	5.13
3.00	2013	5480	0.28	2.21	0.6	4.73	0.67	5.29
3.00	2014	5644	0.28	2.28	0.6	4.88	0.67	5.45
2.75	2015	5799	0.28	2.34	0.6	5.01	0.67	5.60
2.75	2016	5959	0.28	2.40	0.6	5.15	0.67	5.75
2.75	2017	6123	0.28	2.47	0.6	5.29	0.67	5.91
2.75	2018	6291	0.28	2.54	0.6	5.44	0.67	6.07
2.75	2019	6464	0.28	2.61	0.6	5.59	0.67	6.24
2.50	2020	6626	0.28	2.67	0.6	5.72	0.67	6.39
2.50	2021	6791	0.28	2.74	0.6	5.87	0.67	6.55
2.50	2022	6961	0.28	2.81	0.6	6.01	0.67	6.72
2.50	2023	7135	0.28	2.88	0.6	6.16	0.67	6.88
2.50	2024	7314	0.28	2.95	0.6	6.32	0.67	7.06
2.50	2025	7496	0.28	3.02	0.6	6.48	0.67	7.23
2.50	2026	7684	0.28	3.10	0.6	6.64	0.67	7.41
2.50	2027	7876	0.28	3.18	0.6	6.80	0.67	7.60
2.50	2028	8073	0.28	3.25	0.6	6.97	0.67	7.79
2.50	2029	8275	0.28	3.34	0.6	7.15	0.67	7.98
2.25	2030	8461	0.28	3.41	0.6	7.31	0.67	8.16
2.25	2031	8651	0.28	3.49	0.6	7.47	0.67	8.35
2.25	2032	8846	0.28	3.57	0.6	7.64	0.67	8.53
2.25	2033	9045	0.28	3.65	0.6	7.81	0.67	8.73
2.25	2034	9248	0.28	3.73	0.6	7.99	0.67	8.92
2.25	2035	9456	0.28	3.81	0.6	8.17	0.67	9.12
2.25	2036	9669	0.28	3.90	0.6	8.35	0.67	9.33
2.25	2037	9887	0.28	3.99	0.6	8.54	0.67	9.54
2.25	2038	10109	0.28	4.08	0.6	8.73	0.67	9.75
2.25	2039	10337	0.28	4.17	0.6	8.93	0.67	9.97
2.00	2040	10543	0.28	4.25	0.6	9.11	0.67	10.17
2.00	2041	10754	0.28	4.34	0.6	9.29	0.67	10.38
2.00	2042	10969	0.28	4.42	0.6	9.48	0.67	10.58
2.00	2043	11189	0.28	4.51	0.6	9.67	0.67	10.79
2.00	2044	11413	0.28	4.60	0.6	9.86	0.67	11.01
2.00	2045	11641	0.28	4.69	0.6	10.06	0.67	11.23
2.00	2046	11874	0.28	4.79	0.6	10.26	0.67	11.46
2.00	2047	12111	0.28	4.88	0.6	10.46	0.67	11.68
2.00	2048	12353	0.28	4.98	0.6	10.67	0.67	11.92
2.00	2049	12600	0.28	5.08	0.6	10.89	0.67	12.16
1.75	2050	12821	0.28	5.17	0.6	11.08	0.67	12.37
1.75	2051	13045	0.28	5.26	0.6	11.27	0.67	12.59
1.75	2052	13274	0.28	5.35	0.6	11.47	0.67	12.81
1.75	2053	13506	0.28	5.45	0.6	11.67	0.67	13.03
1.75	2054	13742	0.28	5.54	0.6	11.87	0.67	13.26
1.75	2055	13983	0.28	5.64	0.6	12.08	0.67	13.49



ELLIS COUNTY  
SOUTH ELLIS COUNTY WATER SUPPLY CORPORATION

	Avg Day Demand (mgd)	Peak Day Demand (mgd)	Well Supply (mgd)	Rockett/Wax. Water Plant Demand (mgd)
2005	0.14	0.39	0.63	0
2009	0.15	0.43	0.60	0
2010	0.16	0.44	0.39	0.05
2020	0.19	0.55	0.30	0.25
2035	0.26	0.72	0	0.72
2050	0.34	0.97	0	0.97
2055	0.38	1.07	0	1.07

Mountain Peak Sec  
end

ELLIS COUNTY  
SOUTH ELLIS COUNTY WATER SUPPLY CORPORATION

% Growth	Year	Total (Ea.) Conn.	Avg. Use per conn. (gpm/conn.)	Avg. Demand (mgd)	Supply Req. (gpm/conn.)	Req. Supply (mgd)	Peak Day Use per conn. (gpm/conn.)	Peak Demand (mgd)
	2005	441	0.22	0.14	0.6	0.38	0.62	0.39
2.95	2006	454	0.22	0.14	0.6	0.39	0.62	0.41
2.00	2007	463	0.22	0.15	0.6	0.40	0.62	0.41
2.00	2008	472	0.22	0.15	0.6	0.41	0.62	0.42
2.00	2009	482	0.22	0.15	0.6	0.42	0.62	0.43
2.00	2010	491	0.22	0.16	0.6	0.42	0.62	0.44
2.00	2011	501	0.22	0.16	0.6	0.43	0.62	0.45
2.00	2012	511	0.22	0.16	0.6	0.44	0.62	0.46
2.00	2013	522	0.22	0.17	0.6	0.45	0.62	0.47
2.00	2014	532	0.22	0.17	0.6	0.46	0.62	0.47
2.00	2015	543	0.22	0.17	0.6	0.47	0.62	0.48
2.00	2016	553	0.22	0.18	0.6	0.48	0.62	0.49
2.00	2017	564	0.22	0.18	0.6	0.49	0.62	0.50
2.00	2018	576	0.22	0.18	0.6	0.50	0.62	0.51
2.00	2019	587	0.22	0.19	0.6	0.51	0.62	0.52
2.00	2020	599	0.22	0.19	0.6	0.52	0.62	0.53
2.00	2021	611	0.22	0.19	0.6	0.53	0.62	0.55
2.00	2022	623	0.22	0.20	0.6	0.54	0.62	0.56
2.00	2023	636	0.22	0.20	0.6	0.55	0.62	0.57
2.00	2024	648	0.22	0.21	0.6	0.56	0.62	0.58
2.00	2025	661	0.22	0.21	0.6	0.57	0.62	0.59
2.00	2026	675	0.22	0.21	0.6	0.58	0.62	0.60
2.00	2027	688	0.22	0.22	0.6	0.59	0.62	0.61
2.00	2028	702	0.22	0.22	0.6	0.61	0.62	0.63
2.00	2029	716	0.22	0.23	0.6	0.62	0.62	0.64
2.00	2030	730	0.22	0.23	0.6	0.63	0.62	0.65
2.00	2031	745	0.22	0.24	0.6	0.64	0.62	0.66
2.00	2032	760	0.22	0.24	0.6	0.66	0.62	0.68
2.00	2033	775	0.22	0.25	0.6	0.67	0.62	0.69
2.00	2034	790	0.22	0.25	0.6	0.68	0.62	0.71
2.00	2035	806	0.22	0.26	0.6	0.70	0.62	0.72
2.00	2036	822	0.22	0.26	0.6	0.71	0.62	0.73
2.00	2037	839	0.22	0.27	0.6	0.72	0.62	0.75
2.00	2038	856	0.22	0.27	0.6	0.74	0.62	0.76
2.00	2039	873	0.22	0.28	0.6	0.75	0.62	0.78
2.00	2040	890	0.22	0.28	0.6	0.77	0.62	0.79
2.00	2041	908	0.22	0.29	0.6	0.78	0.62	0.81
2.00	2042	926	0.22	0.29	0.6	0.80	0.62	0.83
2.00	2043	945	0.22	0.30	0.6	0.82	0.62	0.84
2.00	2044	964	0.22	0.31	0.6	0.83	0.62	0.86
2.00	2045	983	0.22	0.31	0.6	0.85	0.62	0.88
2.00	2046	1002	0.22	0.32	0.6	0.87	0.62	0.89
2.00	2047	1022	0.22	0.32	0.6	0.88	0.62	0.91
2.00	2048	1043	0.22	0.33	0.6	0.90	0.62	0.93
2.00	2049	1064	0.22	0.34	0.6	0.92	0.62	0.95
2.00	2050	1085	0.22	0.34	0.6	0.94	0.62	0.97
2.00	2051	1107	0.22	0.35	0.6	0.96	0.62	0.99
2.00	2052	1129	0.22	0.36	0.6	0.98	0.62	1.01
2.00	2053	1151	0.22	0.36	0.6	0.99	0.62	1.03
2.00	2054	1175	0.22	0.37	0.6	1.01	0.62	1.05
2.00	2055	1198	0.22	0.38	0.6	1.04	0.62	1.07

City of Venus (provided)  
09/23/07

2004 Master GW  
Plan

EXHIBIT 7A  
GROUND WATER SOURCE  
CITY OF VENUS

Year	Venus Water Consumer Growth Rate	Projected Water Consumer (Within City 2.71 gal. ml)	Projected Water Consumer (City & Part of ETJ 3.10 gal. ml)	Estimated Service Conn. (3.07/Conn.)	Annual Water Demand (Mgd/Vt) (170 gpd)	TCEQ Required Min. Water Supply (gpm) (0.6 gpm/Conn.)	Current Production from Four Existing Wells (5% Decline per Year)	Capacity of New Well (5% Decline per Year)	Required No. of Wells w/o Standby Wells	Elevated Storage (TX Board of Ing. Required Minimum (10 Hr. Supply @ 175 gpd))	Current Elevated Storage (gal)	TCEQ Required Minimum (200 gal/Conn.)	Ground Storage (TX Board of Ing. Required Minimum (1 Day Supply @ 170 gpd))	Current Ground Storage (gal)	TCEQ Required Minimum (200 gal/Conn.)	Total Storage (Current)	TCEQ Required Minimum (200 gal/Conn.)	Current Total Storage (gal)	Pump Station (Current) Total Capacity (gal)
2002	4.70	1069	1233	732	118	434	303	118	1	120404	100000	144600	377883	500000	445508	500000	445508	500000	1000
2003	4.70	1119	1280	752	122	441	303	122	1	123517	100000	147000	387654	500000	450603	500000	450603	500000	1000
2004	4.70	1172	1340	762	145	457	288	250	1	126777	100000	152475	397883	400000	460098	500000	460098	500000	1000
2005	4.70	1227	1403	783	149	470	273	238	1	130189	100000	156877	408594	400000	469699	500000	469699	500000	1000
2006	4.70	1285	1466	804	153	483	260	226	1	133762	100000	160877	419808	400000	479381	500000	479381	500000	1000
2007	4.70	1344	1539	827	158	496	247	214	1	137503	100000	165376	431549	400000	489704	500000	489704	500000	1000
2008	4.70	1408	1611	850	162	510	234	204	1	141420	100000	170087	443841	400000	501166	500000	501166	500000	1000
2009	4.70	1474	1687	875	167	525	223	193	2	145521	100000	175019	456712	400000	513308	500000	513308	500000	1000
2010	4.70	1544	1766	901	172	541	201	184	2	149815	100000	180183	470187	400000	527308	500000	527308	500000	1000
2011	4.70	1616	1849	928	177	557	191	175	2	154310	100000	185590	484286	400000	542162	500000	542162	500000	1000
2012	4.70	1692	1936	956	182	574	181	166	2	159017	100000	191240	498968	400000	557839	500000	557839	500000	1000
2013	4.70	1772	2027	986	188	592	172	158	3	163945	100000	197177	514334	400000	574335	500000	574335	500000	1000
2014	4.70	1853	2122	1017	194	610	164	142	3	169104	100000	203360	530727	400000	591685	500000	591685	500000	1000
2015	4.70	1942	2222	1053	200	630	156	132	3	174506	100000	209880	547662	400000	609931	500000	609931	500000	1000
2016	4.70	2033	2326	1083	206	650	148	128	4	180162	100000	216682	564933	400000	629115	500000	629115	500000	1000
2017	4.70	2129	2435	1119	213	671	140	122	4	186084	100000	223805	583018	400000	649300	500000	649300	500000	1000
2018	4.70	2229	2550	1156	220	694	133	116	5	192284	100000	231261	602477	400000	670700	500000	670700	500000	1000
2019	4.70	2334	2670	1195	228	717	127	110	5	198776	100000	239069	623359	400000	693394	500000	693394	500000	1000
2020	4.70	2444	2795	1236	235	742	120	105	6	205572	100000	247243	645181	400000	717407	500000	717407	500000	1000
2021	4.70	2558	2927	1279	244	767	114	105	6	212699	100000	255802	667515	400000	742851	500000	742851	500000	1000
2022	4.70	2679	3064	1324	252	794	109	99	7	220139	100000	264765	690898	400000	769700	500000	769700	500000	1000
2023	4.70	2805	3208	1370	261	822	104	94	7	227940	100000	274145	715780	400000	797980	500000	797980	500000	1000
2024	4.70	2936	3359	1420	270	852	109	89	8	236107	100000	283967	741013	400000	827624	500000	827624	500000	1000
2025	4.70	3074	3517	1471	278	882	114	84	8	244638	100000	294252	767851	400000	858751	500000	858751	500000	1000
2026	4.70	3219	3682	1524	281	915	114	79	8	253611	100000	305020	795950	400000	890334	500000	890334	500000	1000
2027	4.70	3370	3855	1581	281	949	114	74	8	262985	100000	316284	825369	400000	923411	500000	923411	500000	1000
2028	4.70	3529	4036	1640	313	984	109	69	8	273800	100000	328098	856172	400000	957961	500000	957961	500000	1000
2029	4.70	3694	4226	1702	324	1021	109	64	8	285076	100000	340457	888422	400000	993824	500000	993824	500000	1000
2030	4.70	3868	4425	1767	337	1060	109	59	8	296834	100000	353396	922188	400000	1029976	500000	1029976	500000	1000
2031	4.70	4030	4633	1835	350	1101	109	54	8	309199	100000	366944	957540	400000	1069766	500000	1069766	500000	1000
2032	4.70	4240	4850	1906	363	1143	109	49	8	322141	100000	381128	994555	400000	1110064	500000	1110064	500000	1000
2033	4.70	4439	5078	1980	377	1188	109	44	8	335705	100000	395980	1033309	400000	1153173	500000	1153173	500000	1000
2034	4.70	4648	5317	2058	392	1235	109	39	8	349241	100000	411529	1073884	400000	1200064	500000	1200064	500000	1000
2035	4.70	4867	5567	2139	407	1285	109	34	8	363705	100000	427809	1116367	400000	1251701	500000	1251701	500000	1000
2036	4.70	5085	5829	2224	424	1335	109	29	8	368716	100000	444854	1160846	400000	1307416	500000	1307416	500000	1000
2037	4.70	5315	6102	2314	441	1388	109	24	8	384716	100000	462700	1207416	400000	1420489	500000	1420489	500000	1000
2038	4.70	5548	6389	2407	459	1444	109	19	8	400252	100000	481385	1256174	400000	1478521	500000	1478521	500000	1000
2039	4.70	5848	6690	2503	477	1503	109	14	8	416318	100000	500948	1307225	400000	1537011	500000	1537011	500000	1000
2040	4.70	6123	7004	2607	497	1564	109	9	8	433348	100000	521431	1360674	400000	1602793	500000	1602793	500000	1000

Note: Items in *italic* refer to groundwater may not be available for TCEQ required improvements

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***Attachment B-1  
Selected Comments Provided to Region C in  
Response to Reviews Conducted by Brazos G  
Consultants***



The comment process between Region C and Brazos G consultants was extensive with over 350 emails recorded during development of the “Four County Study” report in addition to numerous phone calls. In an attempt to provide a useful and practical response to address the TWDB’s request for a summary of reviews and comments, this attachment includes several email chains that present the results of selected reviews and comments provided by the Brazos G consultant as a result of these reviews. The comments provided in the attached email may indicate slightly different results than those included in the report, since the review and comment process required several iterations prior to inclusion in the final report.

**Shaw, Kristine**

**From:** Stephanie Griffin [swg@freese.com]  
**Sent:** Friday, February 22, 2008 2:44 PM  
**To:** Shaw, Kristine  
**Subject:** RE: DRAFT population and demand memo for the Four County Study

Kristi-  
 My responses are shown in red below.

**Stephanie W. Griffin, P.E.**

Freese and Nichols, Inc.  
 p (817) 735-7353

**From:** Shaw, Kristine [mailto:Kristi.Shaw@hdrinc.com]  
**Sent:** Friday, February 22, 2008 12:45 PM  
**To:** Stephanie Griffin  
**Cc:** Dunn, David  
**Subject:** RE: DRAFT population and demand memo for the Four County Study

Stephanie,

Due to time constraints, I have taken a cursory review of the attached memo and have some comments for you to consider. Since most were "global" comments for the document, I've attached list below rather than track changes. As I understand from you, this is a draft memo and I'll perform a more detailed review prior to finalizing. Please send me the finalized draft memo that will be sent to RCWPG members.

(1) There were surveys sent to Brandon Irene WSC and Files Valley WSC, both of which have population and demand in Hill County. Were these included in the population/demand estimates? If not, consider footnoting in tables so that information is not misused as total amts. Also, was JCSUD's Hill County population/water demands included in Johnson County tables? If so, this should be footnoted as well.

The county summary tables are simply for the entity areas located within that particular county. I will add a footnote indicating entities that are partially located in other counties.

(2) I noticed in spreadsheets that for water users in multiple counties, the population was prorated amongst applicable counties (i.e. Burleson). Please document the method since this often results in estimates that are different than Brazos G and Region C 2006 Plan projections.

Bethesda WSC is the same as what was included in DB07.

Burleson has 20% in Tarrant County and 80% in Johnson County (Based on breakdown used in DB07. Because the change was so minor over time, the 80/20 split remained constant.)

Johnson County SUD is based on the percent breakdown used in DB07.

Mansfield told us when we met that they expect all growth to occur in the southern area of their city. Mansfield in Tarrant and Ellis Counties kept the same values in 2010 as are shown in DB07. The 2010 value was increased by 3% in 2020 and by 2% in 2030. The Mansfield Johnson County got all of the remaining population.

Mountain Peak SUD uses the same percentages of population in each decade as was used in DB07.

Parker WSC is based on 15% being in Hill County and 85% in Johnson County as was shown in DB07 for 2010. The change was minor over time and the percentage was held constant.

I do not see the value in adding this description to the memo. None of these entities look at themselves divided by county or basin lines. If you have questions about other splits or want to discuss the method for a particular split, let me know.

(3) Was JCSUD and JCFWSD # 1 combined in estimates? If so, please add footnote or text.

Yes. JCFWSD#1 is included in JCSUD. I will add a footnote.

(4) JCSUD 2006 Plan shows estimated 39,485 people in 2010 (i.e. 14358 x 2.75 people per connection). Could you please clarify where low population of 41,250 came from (i.e. Table 2)?

When we met with JCSUD, Terry said that he didn't expect to have more than 15,000 connections by 2010.  $15,000 \times 2.75 = 41,250$ . I will adjust this number to match the  $14,358 \times 2.75$  people per connection.

(5) Did Acton MUD receive a survey? If not, may want to consider footnoting in tables since I think it implies that they have been contacted and/or participated in the study.

Acton MUD is primarily in Hood County. We did not send a survey to them. I will add a footnote to those entities primarily in counties outside of the study area that were not surveyed.

(6) Venus population is different by 1000. Was that included to account for prison inmates?

Yes, the prison population is that additional 1,000 people. This matches the information they provided to us when we met

3/24/2009



with them.

(7) In Table 3, gpcd projections I spot checked how gpcd was calculated. In JCSUD's case, it appears that it was calculated based on population in ellis county (< 1% JCSUD's population) rather than Johnson County (> 95% of population). I think if GPCD is going to be generalized for water user groups and it varies amongst multiple counties that it should be based on county with the majority of the user's population.

I believe that the gpcd should be the same across an entity, no matter how many counties/basins it crosses. The gpcd for Johnson County SUD was based on the Johnson County gpcd calculated from DB07, including JCSUD, JCFWSD, and Joshua. Using the Johnson County portion demand of 8,780 AF/Y in 2010, 11,242 AF/Y in 2020 and 13,957 AF/Y in 2030 and the Johnson County populations of 49,097 in 2010, 61,952 in 2020, and 75,457 in 2030, I get 160 gpcd in 2010, 162 gpcd in 2020, and 165 gpcd in 2030.

(8) In Wholesale Water Providers section, it mentions that "Grand Prairie will become a wholesale water provider...". Tables 14-17 include recommended population and demand projections attributed to wholesale water users. Consider adding similar table for Grand Prairie.

I will add a table for Grand Prairie. We are also adding a note that Arlington is interested in becoming a wholesale water provider in the future. We will not add a table for this as they do not have any contracts in the works that are ready to be shared.

(9) Joshua's population and demands in Table 7 does not match population and demands shown in Table 2 and Table 5, respectively. Please clarify and/or add footnote.

The difference is due to the fact that Joshua has groundwater supplies in addition to the surface water they purchase from JCSUD. Thus, the entire population and demand are not attributed to JCSUD. The groundwater use is backed out of the demand on JCSUD. Then the gpcd is used to back calculate the population attributed to JCSUD.

(10) Meeting minutes from meeting with JCSUD includes contract negotiations with Mansfield for 5-6 mgd (peak) water supply. This is not mentioned in memo or included in Table 8 or Table 14.

I will add this and the Grand Prairie contracts to the tables. I had not originally included them because they are not final. However, they are very likely to happen.

(11) JCSUD's SWATS contract is for 7 MGD (i.e. 7846 acft/yr). Could you please describe the source of 9,700 acft in Table 17. Also, the JCSUD contracts are for Lake Granbury supplies (not Lake Whitney).

Brad Brunett sent me the 9,700 AF/Y number yesterday. I have straightened out the JCSUD source, as well as the Aquilla WSD source.

As a suggestion, when I read the conclusion it left me with the following question: "How many water users considered in this study have sufficient supplies (with existing contracts)? And how many have shortages?" It may be beneficial to add a statement that this will be considered when evaluating scenarios for providing additional water supplies in the 4 county region.

I can add some text to this effect.

Thanks for sending to us for review. Hope you have a good weekend.

Kristi

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**From:** Stephanie Griffin [mailto:swg@freese.com]

**Sent:** Thursday, February 21, 2008 8:29 AM

**To:** Wayne Owen; Bill Smith; jo.puckett@dallascityhall.com; Brad Brunett; Michael McClendon; Tom Gooch; Shaw, Kristine; Dunn, David; McDonald, Brian; jminahan@apaienv.com

**Subject:** RE: DRAFT population and demand memo for the Four County Study

Good Morning!

Here is a revised version of the memo. I have included Wayne's editorial comments. I have added the BRA information (shown in tracked changes).

Tom just stopped by and suggested that we may not want to include the overall graphs for the study area, as the large cities not in Ellis and Johnson County seem to skew the growth in the study area. He and I will discuss this tomorrow before I send the draft memo to the RCWPG. The memo is a discussion item on the RCWPG agenda for their meeting on Monday.

I am heading over to a class that will last the whole day. If you have comments or questions, please send those to me. I will get those at the end of the day, unless we get a break earlier! I plan to make revisions this evening and tomorrow morning after talking with Tom about the overall study area graphs. If you have any thoughts on the overall study area graphs, please send them to me!

Sincerely,

3/24/2009

Stephanie

**Stephanie W. Griffin, P.E.**

Freese and Nichols, Inc.  
p (817) 735-7353

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**From:** Stephanie Griffin

**Sent:** Thursday, February 14, 2008 4:38 PM

**To:** 'Wayne Owen'; 'Bill Smith'; Jody Puckett (jo.puckett@dallascityhall.com); 'Brad Brunett'; 'Michael McClendon'; Tom Gooch; 'Shaw, Kristine'; 'Dunn, David'

**Subject:** DRAFT population and demand memo for the Four County Study

Good Afternoon!

Here is the DRAFT population and demand projection memo for the Four County Study. Please review and send any suggested revisions to me by 3 PM on Thursday, February 21. I plan to make revisions that evening. I plan to send the revised draft report to the Region C Water Planning Group on Friday, February 22. I will be presenting the draft memo to the Planning Group on February 25<sup>th</sup>.

If you have any questions, please let me know.

Sincerely,  
Stephanie

**Stephanie W. Griffin, P.E.**

Water Resources Planning

Freese and Nichols, Inc.  
4055 International Plaza  
Suite 200  
Fort Worth, TX 76109  
p (817) 735-7353  
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**Shaw, Kristine**

**From:** Shaw, Kristine  
**Sent:** Tuesday, May 27, 2008 1:23 PM  
**To:** 'Stephanie Griffin'; Dunn, David  
**Subject:** RE: Johnson County graphs

Stephanie,

As I understand, you developed the recommended population of 39,485 in 2010 up to 110,833 in 2030 based on Table 2-2 from JCSUD's Water Supply Plan (Dec 2006) and 2.75 people per connection which **includes Joshua**. How did you calculate recommended JCSUD demands of 7,077 acft in 2010; 13,287 acft in 2020; and 20,610 acft in 2030? Looks like the breakdown by county is based on projected population (as percent of total) in each county. If the Ellis/Hill/Johnson/and Tarrant demands were calculated based on population then these numbers may already include Joshua (which was previously served completely by JCFWSD # 1). It still appears that the demand table that you provided may be double counting the Joshua demands. We request that you break out the Johnson County demands as Johnson County (JCSUD) and Johnson County (Joshua) and remove the separate line item for Joshua. The difference in the total number of connections from Table 2-2 and Table 2-1 (from JCSUD's Water Supply Plan) are the number of connections attributed to Joshua in Johnson County.

Please also see the notes embedded in green text below. Feel free to call if you need additional clarification.

Thanks,  
 Kristi

**Kristi Shaw, P.E.**

**HDR ONE COMPANY | Many Solutions**

4401 West Gate Boulevard, Suite 400 | Austin, TX | 78745

Phone: 512.912.5118 | Fax: 512.912.5158 |

Email: kristi.shaw@hdrinc.com

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**From:** Stephanie Griffin [mailto:swg@freese.com]  
**Sent:** Tuesday, May 27, 2008 12:11 PM  
**To:** Dunn, David  
**Cc:** Shaw, Kristine  
**Subject:** RE: Johnson County graphs

On Johnson County SUD, I have run across a few issues that we need to clarify...

1. I can remove the year 2010 Grand Prairie demand on Johnson County SUD. No problem there. **Thanks**
2. I cannot remove the Ellis County demand on the SUD, unless it doesn't exist in Ellis County. I can change the percentage of the WUG in Ellis County, but the TWDB shows that the SUD exists in Ellis County. Does Johnson County SUD not exist in Ellis County? The percentage of JCSUD demand was allocated assuming that 0.43% of the pop/demand is in Ellis County, 95.05% is in Johnson County, 4.2% is in Tarrant County, and 0.32% is in Hill County. In the summary table in the memo and in the Excel sheet, the SUD is listed as its own entity (broken down by county and basin) and Joshua is listed as a customer. (See attached Excel file.) **JCSUD does currently exist in Ellis County, but JCSUD estimates losing these connections in the future. To simplify, I'd recommend keeping in population and demand tables and then in the potential future customer demands showing Potential Loss of \_\_\_ connections in Ellis County (similar to the line items for Fort Worth and Burleson).**
3. The demand and supplies shown in the Excel sheet are average day (dry year) numbers. It is my understanding that the 6 MGD from Grand Prairie and the 6 MGD from Mansfield are peak day supplies. Using a peaking factor of 2, I get an average day supply of 3 MGD from each source. Has something changed or is the answer Terry wants in order to meet the 2030 shortfall? **JCSUD is currently negotiating contracts with Grand Prairie and Mansfield. According to Terry although the Grand Prairie contract specifies a peak of 6 MGD, it does not show a max yearly supply so the peak contracted supply could be utilized every day. He requested to include 6 MGD for Mansfield and 6 MGD for Grand Prairie.**
4. As a follow-up on Kristi's Alvarado question, JCSUD has an emergency connection with Alvarado. It is my

3/24/2009

understanding that Alvarado has been taking water from them in recent years. If Terry wants to remove that, I can do so. **We do not request removing Alvarado water. It is true that JCSUD has been providing them water over the past few years. Please leave as is in the table.**

Let me know your thoughts.

Sincerely,  
Stephanie

**Stephanie W. Griffin, P.E.**

Water Resources Planning  
Freese and Nichols, Inc.

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**From:** Dunn, David [mailto:David.Dunn@hdrinc.com]  
**Sent:** Thursday, May 22, 2008 5:43 PM  
**To:** Stephanie Griffin  
**Cc:** Shaw, Kristine  
**Subject:** FW: Johnson County graphs

Stephanie,

Kristi sent this to me last night and called me this afternoon to make sure I sent it to you. I have added some text to the Word document that should help clarify things. My text is in blue and burgundy.

We would also suggest removing Joshua demands from Johnson County SUD to avoid any confusion in the future. Joshua is considered to be a WUG by the TWDB, and it will be less confusing to have Joshua and their demands shown separately, with Johnson SUD supplying their demands. This will avoid any double counting when we get to developing the regional water plan. I do not see the TWDB agreeing to remove Joshua as a WUG.

David

**David D. Dunn, P.E.**

Vice President/Project Manager

**HDR | ONE COMPANY | Many Solutions**

4401 West Gate Boulevard, Suite 400 | Austin, TX | 78745

Phone: 512.912.5136 | Fax: 512.912.5158 | Email: David.Dunn@hdrinc.com

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**From:** Shaw, Kristine  
**Sent:** Wednesday, May 21, 2008 8:32 PM  
**To:** Dunn, David  
**Subject:** RE: Johnson County graphs

David,

Here's a suggested response for Stephanie. The attached discussion of Cleburne was based on information provided by Grady and supplements discussion below. Also, the pdf supports discussion below about JCSUD. Please incorporate your comments and send to Stephanie early Thursday if possible.

Thanks,  
Kristi

cell: 576-7429

-----  
3/24/2009

Stephanie,

Based on our conversation last Wednesday, here is clarification regarding items that we looked into:

**From:** Stephanie Griffin [mailto:swg@freese.com]  
**Sent:** Wednesday, April 30, 2008 9:22 AM  
**To:** Shaw, Kristine  
**Subject:** Johnson County graphs

Kristi-

Here is the file we have put together showing the projected demands based on this study and the current supplies. There is also information regarding future supplies based on the 2006 Plan. I have put notes on the graphs explaining how shortages will be met, when known. I am sending you all of the tables and graphs as some of the tables have date linked to one another. For the TRWD customers, we changed the current and future supplies being graphed to represent the amount of water contracted. Wayne needed this information to help answer the question as to who really needs additional contracts and who has enough supply contracted through 2030. For the current DWU customers, we are assuming that DWU will bring on supply needed to meet these demands and there will not be any shortages. (Grand Prairie is an exception to this assumption.) I did not change the graphs to reflect "no shortages" for DWU current customers.

The blue tabs are the Johnson County entities. These are the ones I could use your help solving (particularly the ones in **BOLD**). The following summarizes my understanding of the situation:

Acton MUD – no shortage; no changes needed

**Alvarado – purchase from Johnson County SUD or from Midlothian (Midlothian has not been approached with this idea but TRWD is open to it); let me know your thoughts**

**For Alvarado, add as WMS Venus- Through Contract With Midlothian; and as alternate strategies JCSUD and Groundwater**

**Burleson – no shortage; Why doesn't Burleson have conservation as a strategy?**

**As discussed, Burleson shows 140 gpcd by 2030. Conservation is encouraged for all entities, but only those exceeding 140 gpcd by 2030 had accelerated conservation targets recommended.**

**Bethany WSC – shortage in 2010 and beyond; 2006 Plan recommended JCSUD for supply; noted in survey response that they are considering Keene as a possible source of supply; does Bethany want to add Keene as a strategy? Is Keene willing to sell to them?**

**Discussed with James Minor (City of Keene) on 5/19. Keene is projecting excess water supplies in the future and amenable to providing water to Bethany WSC. Keene is not actively pursuing additional supplies (BRA SWATS is sufficient) although on a long-term basis they would like to secure water supplies from TRWD.**

**Add Keene and JCSUD as possible WMS for future supplies.**

Bethesda WSC – shortage in 2010 and beyond; planning to increase contract for Fort Worth supply to meet needs; SWG will call and ask about Arlington as a potential supplier for the east side of system

Brandon-Irene WSC – no shortage; no changes needed

Cleburne – no shortage; no changes needed

**Please see attached specifics regarding Cleburne, Johnson County- Manufacturing and Mining, and contracted supplies based on our records.**

**Godley – shortage in 2010 and beyond; 2006 Plan recommended BRA SWATS; any changes to this recommendation?**

**No changes to the recommendation.**

**Grandview – shortages in 2010 and beyond; no strategies in 2006 Plan but has shortages now; suggested BRA SWATS as potential source in response to survey; is that the recommended strategy we should use for this study?**

**Use BRA SWATS as recommended strategy per Grandview's request.**

**Johnson County SUD – shortage in 2030 even after considering the contracts being negotiated with Grand Prairie and Mansfield right now; How do we meet this shortage?**

**Johnson County SUD recommends removing Ellis County and Grand Prairie demands. Furthermore, the supplies from Grand Prairie and Mansfield need to be increased to 6 MGD (for each supply), per Terry Kelley. Based on spreadsheet that you provided, I wasn't able to determine exactly how the demands for Ellis/Tarrant/Johnson/Hill county were determined. However, the population needs to be separated for Johnson County (JCSUD) and Johnson County (Joshua) based on attached tables (Tables 2-1 and 2-2). Please continue this format through the demand section. Joshua = JCFWSD # 1**

**Future WMS: TRWD supplies**

Joshua – no shortage; no changes needed

3/24/2009

Keene – no shortage; no changes needed

**Parker WSC – shortage in 2010 and beyond; 2006 Plan recommended BRA SWATS; entity increased supply from BRA SWATS in survey response; assume BRA SWATS is the answer?**

**Yes, BRA SWATS for Parker WSC.**

**Rio Vista – shortages in 2010 and beyond; 2006 Plan recommended BRA SWATS; entity also plans to drill another well in Trinity aquifer and add storage according to survey response; any other strategies to consider?**

**Consider as alternate, Cleburne due to proximity. Note: Cleburne has not been contacted about this. This was based on recommendation of JCSUD due to proximity of Cleburne and Rio Vista.**

Venus – no shortages; no changes needed

**Johnson County-Other – no shortages; any changes needed?**

We made a slight adjustment to Cleburne’s population and demand projections to match the latest information they sent to TRWD. They are included in these tables. That’s the only change that I remember for the population and demand memo. I will send the updated memo next week. We will be seeking the RCWPG approval of that memo on June 2.

If you have any questions, let me know. If you want to schedule a phone conference to run through these – before or after you finish reviewing them, just let me know. Do you think you could send your recommendations for these entities by May 15?

Thanks!  
Stephanie

**Stephanie W. Griffin, P.E.**  
Water Resources Planning

**Freese and Nichols, Inc.**  
4055 International Plaza, Suite 200  
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**Shaw, Kristine**

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**From:** Shaw, Kristine  
**Sent:** Monday, June 30, 2008 5:04 PM  
**To:** 'Stephanie Griffin'  
**Subject:** RE: Johnson County questions

Stephanie,

Please see comments below.

Thanks,  
Kristi

---

**From:** Stephanie Griffin [mailto:swg@freese.com]  
**Sent:** Monday, June 30, 2008 4:29 PM  
**To:** Shaw, Kristine  
**Subject:** Johnson County questions

Hi Kristi!

I got your message. We are still working on the draft report for the Four County Study – getting close to finishing it!!! I will send you a copy as soon as it is ready. I have a couple of questions for you:

1. Parker WSC plans to drill additional wells in Johnson County for additional supply. Is there any groundwater available to allocate to Parker WSC for this purpose? (They may be interested in pursuing WIF Funding.)  
[Which aquifer? Their current supply is from the Trinity Aquifer, which is currently overallocated \(see comment below\).](#)
2. Rio Vista plans to drill a new well in the Trinity aquifer. Can we add that as a strategy? (They may be interested in pursuing WIF funding.)  
[According to groundwater availability estimates, additional Trinity supplies are not available. If added as a strategy for Rio Vista, please qualify as "New Well in the Trinity Aquifer for a short-term basis while additional strategies are being pursued".](#)
3. For the Cleburne supplies, can you remind me what the 2,417 AF/Y in 2010 called "Additional Water from Lake Whitney (BRA)" is?  
[That seems to have been a carry-over from data that you supplied in a spreadsheet. The 2417 acft/ in 2010 is not mentioned in the 2006 Brazos G Plan.](#)

Thanks!  
Stephanie

**Stephanie W. Griffin, P.E.**  
Water Resources Planning

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**Shaw, Kristine**

**From:** Shaw, Kristine  
**Sent:** Thursday, September 04, 2008 11:27 AM  
**To:** 'Stephanie Griffin'  
**Subject:** RE: revisions to Section 2

Stephanie,

Thanks for the feedback. I appreciate you compiling such a detailed response for comments! Please see insertions below, for clarification.

Kristi

---

**From:** Stephanie Griffin [mailto:swg@freese.com]  
**Sent:** Thursday, September 04, 2008 9:17 AM  
**To:** Shaw, Kristine  
**Subject:** revisions to Section 2

Kristi-

I worked on Section 2 last night. I wanted to provide the following updates/questions to you:

1. Table 2.2, the Rural County-Other for 2000 recalculates to 65,593 (not 65,066). Did I miss something? [My calculations show that Rural County-Other recalculates to 65,066 when changing Mansfield from 129 to 622 \(and keeping county total at 126,811\).](#)
2. Brandon-Irene WSC shows Trinity aquifer (Hill County) as a current source in DB07. They did not respond to the survey. Is that Hill County groundwater not a current supply? (Table 2.4) [Perhaps qualify Trinity Aquifer \(Hill County\) since table is for Ellis County.](#)
3. My understanding of JCSUD's contract for 40 MG/Y of Mansfield water is that the pipeline is not yet in place. So, the Mansfield supply should remain in the "Contracted Supplies Not Yet in Use" column in Table 2.4. Is my understanding correct? [According to JCSUD, they are currently using a small supply from Mansfield and currently negotiating contract for supply increase. Based on this information, it should be in "current supplies".](#)
4. For Figure 2-1 and Table 2.4, we are not planning to show the retail supplies (unless they are significant) from Rockett and other suppliers. The Sardis-Lone Elm supply to Midlothian is retail and is a small portion of the city. I have removed this supply from Table 2.4. [OK](#)
5. I am checking with Tom on the Midlothian supply from TRWD (TRA). I believe we need to add this to Table 2.4 (second column) and to the Figure 2-1. [Tom's input on #5. Midlothian has a contract but the water cannot be used until a WTP is built. So the TRWD through TRA will remain as a Contracts Supply Not Yet in Use. Suggest removing TRWD \(through TRA\) from current supplies.](#)
6. You are correct that Oak Leaf and Pecan Hill do not have groundwater supplies.
7. Red Oak has a contract with TRA for supply, which it does not plan to use. The source is not Joe Pool Lake. The Joe Pool Lake supply to Red Oak in DB07 is the retail supply that Rockett supplies within the city limits. I will leave the "Contracted Supplies Not Yet in Use" just as "TRWD water through TRA". [Sounds good.](#)
8. I added TRA in front of Lake Bardwell for Rice WSC (Table 2.4).
9. Good catch on the existing Dallas contract for Rockett SUD in Table 2.4! I also added that to Waxahachie.
10. Sardis-Lone Elm WSC currently relies on groundwater. A portion of their service area receives retail supply from Midlothian. That is not really a contracted supply that is not in use. (Table 2.4) [In Table J.1 of 2006 Region C Plan, it shows 0 Midlothian supplies from 2010 to 2060. Is the Midlothian supply planning to go away for Sardis-Lone Elm WSC in the future?](#)
11. The additions you mentioned for Ellis County Manufacturing and SEP have been made in Table 2.4.
12. Page 2-7, Grand Prairie currently has and uses a 2 MGD (peak day) contract with Fort Worth (TRWD sources). I believe the constraint to increasing that supply is the pipeline size. There may also be some politics involved. [Consider modifying sentence to show Ennis and Grand Prairie get water indirectly from TRWD through contracts with TRA and Fort Worth, respectively. JCSUD has contract for TRWD water through Mansfield. I think this would tie in and be consistent with rest of the paragraph which qualifies \(through TRA\) for Ellis-County](#)

3/24/2009

**Shaw, Kristine**

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**From:** Shaw, Kristine  
**Sent:** Wednesday, September 10, 2008 12:25 PM  
**To:** 'Stephanie Griffin'  
**Subject:** Appendix C- Population and Demand Projection Memo  
**Attachments:** Status\_090908.ppt

Stephanie,

As you are busily addressing comments for the four county study, I have a few initial comments for the memo (Appendix C) as listed below. I understand that it is a tremendous effort to incorporate comments especially with so many numbers in the report. Kudos!

(1) Figure 2- Typo in legend (2006 Brazos G Plan)

Include JCFWSD#1 population in 2006 Region C Plan line

(2) Figure 3- Include JCFWSD#1 population in 2006 Region C/Brazos G Plan line

(3) Table 3- Include JCFWSD#1 population in 2006 Regional Water Plan columns (total for Johnson County should equal 151,468 and 180,509 and 211,020 for 2010-2030 respectively). For recommended columns, I'd suggest adding footnote to say that JCFWSD#1 population is included in JCSUD projections.

(4) Table 7- Include JCFWSD#1 demands in 2006 Regional Water Plan columns (total for Johnson County should equal 32,407 and 37,478 and 42,911 for 2010-2030 respectively). For recommended columns, I'd suggest adding footnote to say that JCFWSD#1 population is included in JCSUD projections.

(5) At bottom of text on page 20 when describing adjustments to demands for non-municipal use, include a sentence mentioning increasing water demands for Cleburne S&E and Manufacturing based on information provided by Cleburne.

(6) Regarding Tables 9 - 11, I think it would be useful to add text to explain why population and demand projections for wholesale water providers (in tables 9-11) are different than those shown in Tables 3 and 7.

(7) Table 10: revise to be consistent with format of comparable tables for other WWP by stating "In-City, xxx County Portion" for population and demand projections.

verify Joshua, seems like population should be equal to those shown in Table 3

verify Tarrant County population portion. Shouldn't it be 32,281 for 2010 and 94,540 for 2030 based on Table 3? or is 2010 population adjusted upward to reflect supply to Grand Prairie?

(8) Revise Table 11 and 12 to state "In City Portion" for population projections (remove "demand")

(9) Regarding Table 11, how are you divvying up population projections for JCSUD and Grand Prairie. Is population (and demands) possibly being double counted and included in Tables 9 and 10?

I've attached a couple of tables with Johnson County WUG totals for your reference. Please call if you have questions.

Thanks,  
 Kristi

entities.

- 13. Page 2-7, Oak Leaf gets a small amount of retail supply from Rockett SUD. I am not including them in the TRWD write-up because they are not a wholesale customer. OK
- 14. I will include Pecan Hill in the TRWD write-up because Rockett SUD supplies them 100% retail.
- 15. Sardis-Lone Elm WSC is also not included in the TRWD write-up because they are a potential future customer, not an existing customer.
- 16. Page 2-12, the list of sources is based on the 2006 Plan. JCSUD was listed as a potential participant in the Dallas project for Ellis County. Terry would like to keep Dallas as an alternative – just in case he needs that some day. Stating that JCSUD would seek "additional water from Dallas" suggests that it now receives water from Dallas. This comment also applies to others in the list (i.e. Rockett SUD & Waxahachie). I would suggest qualifying by footnote or otherwise "An alternative strategy for JCSUD is to purchase water from Dallas, however this strategy is not being actively pursued." It seems like the others in the list (i.e. Red Oak, Glenn Heights, Grand Prairie) have more active plans (i.e. contracts) for additional water from Dallas.

You spent a lot of time on Table 2.4 and I appreciate your help! I am glad to see that the Johnson County tables appear to have passed your review! I am glad I worked on Section 2 last night. It took longer to get through than I had expected. I will send you additional updates/answers/questions as I incorporate your comments in the remaining chapters.

Sincerely,  
Stephanie

**Stephanie W. Griffin, P.E.**  
Water Resources Planning

**Freese and Nichols, Inc.**  
4055 International Plaza, Suite 200  
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***Attachment B-2  
Interim Progress Report Update on  
Brazos G Activities in Support of  
Region C's Four County Water Supply Study***

(Presentation from Brazos G Regional Water Planning Group on October 29, 2008)





## **Agenda Item 6.5**

### **Study No. 4 Update on Brazos G Activities in Support of Region C's Four County Water Supply Study**

October 29, 2008

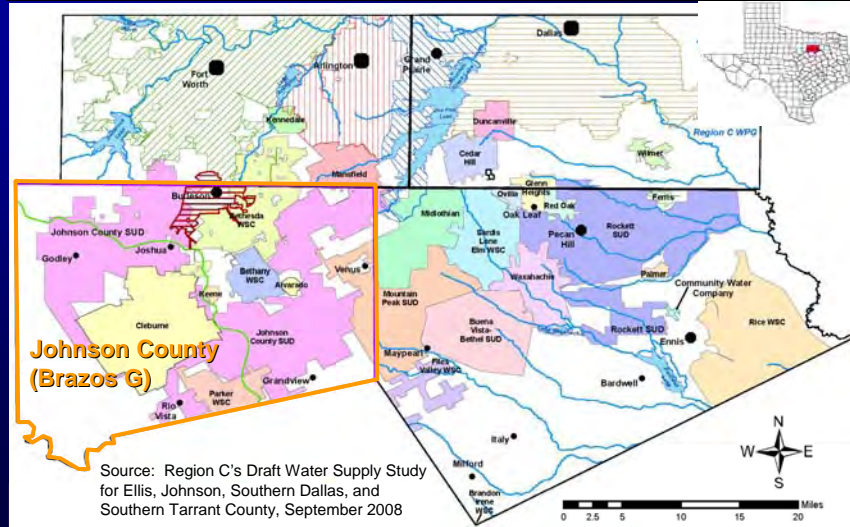


## **Background on Study**

- ✓ Study area covers **Johnson**, Ellis, and southern portion of Tarrant and Dallas Counties
- ✓ Joint study between Region C and Brazos G
- ✓ Study time period through Year 2030
- ✓ Study Objectives:
  - Review recent growth in the study area
  - Consider population and demand projection updates compared to 2006 Plans and recommend revisions (as necessary)
  - Update current and future water supply plans



## Study Area



3



## Progress Report

- ✓ Met with most Johnson County Water User Groups located in the Trinity River Basin
- ✓ Survey sent to remaining Johnson County municipal entities
- ✓ Evaluated changes to population and water demand projections based on water user group feedback
- ✓ Draft updates to current and future supplies based on water user plans
- ✓ Preliminary analysis of water management strategy costs
- ✓ Met with major regional water providers in Brazos G and Region C study area (BRA, TRWD, TRA, City of Dallas)



4



## Estimated 2007 Population for Johnson County Cities

City	2000 Census Population	State Data Center Estimated 2007 Population	% Average Annual Growth Rate
Cleburne	26,005	29,567	1.85%
Burleson*	17,514	27,329	6.56%
Keene	5,003	5,971	2.56%
Joshua	4,528	5,299	2.27%
Alvarado	3,288	4,087	3.16%
Venus	1,892	2,435	3.67%
Grandview	1,358	1,543	1.84%
Godley	879	1,061	2.72%
Rio Vista	656	768	2.28%
Mansfield*	622	867	4.86%
Rural County-Other	65,066	74,372	1.93%
County Total	126,811	153,299	2.75%

\*Some of the population in these communities is located in neighboring counties.

Notes: Only the population for the portion of the entity located in Johnson County is shown here.

Most of the areas outside city limits are supplied by special utility districts and water supply corporations.

Rural County-Other served by water supply corporations, special utility districts, and cities with population less than 500 people. County-Total includes city population and rural unincorporated areas within the county.



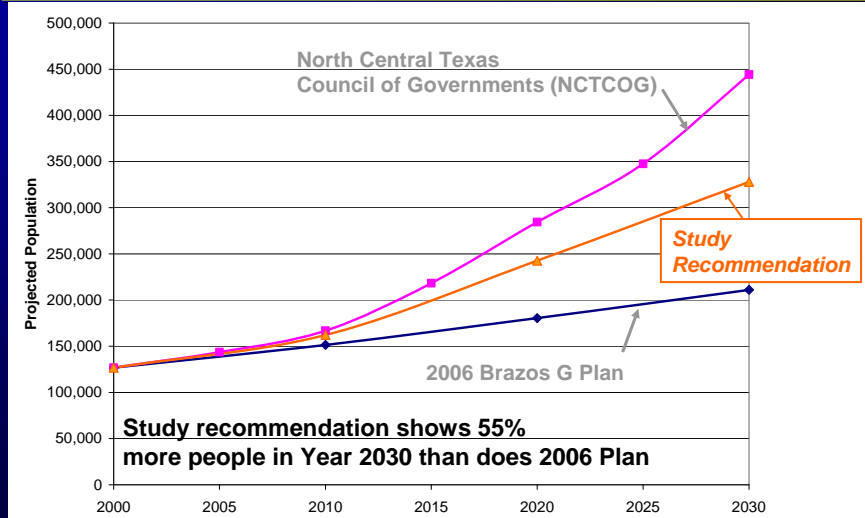
## Population Projections for Johnson County Water User Groups

WUG	2006 Brazos G RWP Population Projections			Recommended Draft Population Projections (4 County Study)			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Johnson County									
Acton MUD (P)	133	171	211	133	171	211	0%	0%	0%
Alvarado	3,595	3,957	4,337	4,439	7,535	10,766	23%	90%	148%
Bethany WSC	3,373	3,813	4,275	4,300	4,500	4,750	27%	18%	11%
Bethesda WSC (P)	19,035	24,199	29,625	19,035	24,199	29,625	0%	0%	0%
Burleson (P)	20,303	23,588	27,039	27,206	42,037	52,747	34%	78%	95%
Cleburne	29,158	32,872	36,774	30,946	38,683	48,353	6%	18%	31%
Godley	1,136	1,439	1,757	1,136	1,439	1,757	0%	0%	0%
Grandview	1,452	1,562	1,678	1,600	2,000	2,500	10%	28%	49%
Johnson County SUD (P) and JCFWSD #1	43,983	56,147	68,926	32,281	62,090	94,540	-27%	11%	37%
Joshua	5,114	5,805	6,531	5,523	7,895	11,369	8%	36%	74%
Keene	5,882	6,917	8,004	5,882	6,917	8,004	0%	0%	0%
Mansfield (P)	626	631	636	10,833	23,472	37,827	1631%	3620%	5848%
Mountain Peak SUD (P)	1,733	2,360	3,019	1,979	3,039	4,460	14%	29%	48%
Parker WSC (P)	2,187	2,697	3,233	2,311	2,396	2,481	6%	-11%	-23%
Rio Vista	751	863	981	751	863	981	0%	0%	0%
Venus (P)	1,892	1,892	1,892	2,766	3,795	5,425	46%	101%	187%
County-Other	11,115	11,596	12,102	11,115	11,596	12,102	0%	0%	0%
Johnson County Total	151,468	180,509	211,020	162,236	242,627	327,898	7%	34%	55%

NOTE: TWDB 2006 Brazos G Plan JCFWSD #1 projections of 6,437 (2010) and 7,750 (2020), and 9,129 (2030) added to Johnson County SUD.



## Johnson County Population Projections



7



## Municipal Per Capita Use Projections for Johnson County Water User Groups

WUG	2006 Brazos G RWP Per Capita Projections (GPCD)			Recommended Draft GPCD Projections (4 County Study)			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Johnson County									
Acton MUD	144	141	139	143	141	139	-1%	0%	0%
Alvarado	121	117	115	121	117	115	0%	0%	0%
Bethany WSC	96	93	90	98	95	94	2%	2%	4%
Bethesda WSC	129	126	124	129	126	124	0%	0%	0%
Burleson	146	142	140	165	161	159	13%	13%	14%
Cleburne	176	173	170	180	180	180	2%	4%	6%
Godley	131	128	127	131	128	127	0%	0%	0%
Grandview	128	125	122	128	125	122	0%	0%	0%
Johnson County SUD	167	164	162	164	166	171	-2%	1%	6%
Joshua	130	126	123	130	126	123	0%	0%	0%
Keene	94	91	89	94	91	89	0%	0%	0%
Mansfield	235	243	241	220	218	216	-6%	-10%	-10%
Mountain Peak SUD	161	159	158	149	147	146	-7%	-8%	-8%
Parker WSC	117	114	111	117	114	111	0%	0%	0%
Rio Vista	84	80	77	84	80	77	0%	0%	0%
Venus	133	131	128	170	170	170	28%	30%	33%
County-Other	223	221	219	223	221	219	0%	0%	0%



8



## Municipal Water Demand Projections in Johnson County (by Water User Group)

WUG	2006 Brazos G RWP Water Demand Projections			Recommended Draft Water Demand Projections (4 County Study)			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
<b>Johnson County- Municipal</b>									
Acton MUD (P)	21	27	33	21	27	33	0%	0%	0%
Alvarado	487	519	559	602	988	1,387	24%	90%	148%
Bethany WSC	363	397	431	470	480	500	29%	21%	16%
Bethesda WSC (P)	2,751	3,415	4,115	2,751	3,415	4,115	0%	0%	0%
Burleson (P)	3,320	3,752	4,240	5,029	7,582	9,395	51%	102%	122%
Cleburne	5,748	6,370	7,003	6,244	7,802	9,753	9%	22%	39%
Godley	167	206	250	167	206	250	0%	0%	0%
Grandview	208	219	229	229	280	341	10%	28%	49%
Johnson County SUD (P) and JCFWSD #1	8,036	10,423	13,058	5,963	11,571	18,100	-26%	11%	39%
Joshua	744	819	899	804	1,114	1,566	8%	36%	74%
Keene	620	705	798	620	705	798	0%	0%	0%
Mansfield (P)	165	172	172	2,670	5,732	9,153	1518%	3233%	5222%
Mountain Peak SUD (P)	313	420	534	330	500	730	5%	19%	37%
Parker WSC (P)	287	344	402	303	306	308	6%	-11%	-23%
Rio Vista	71	77	85	71	77	85	0%	0%	0%
Venus (P)	282	278	271	527	723	1,033	87%	160%	281%
County-Other	2,776	2,871	2,969	2,776	2,871	2,969	0%	0%	0%
<b>Johnson County Municipal Total</b>	<b>26,359</b>	<b>31,014</b>	<b>36,048</b>	<b>29,577</b>	<b>44,379</b>	<b>60,516</b>	<b>12%</b>	<b>43%</b>	<b>68%</b>

Note: TWDB 2006 Brazos G Plan JCFWSD #1 projections of 844 acft (2010) and 990 acft (2020), and 1,135 (2030) added to Johnson County SUD projections of 7,192 acft (2010) and 9,433 acft (2020) and 11,923 acft (2030).



All units are in acre-feet per year.



## Municipal and Non-Municipal Water Demand Projections in Johnson County

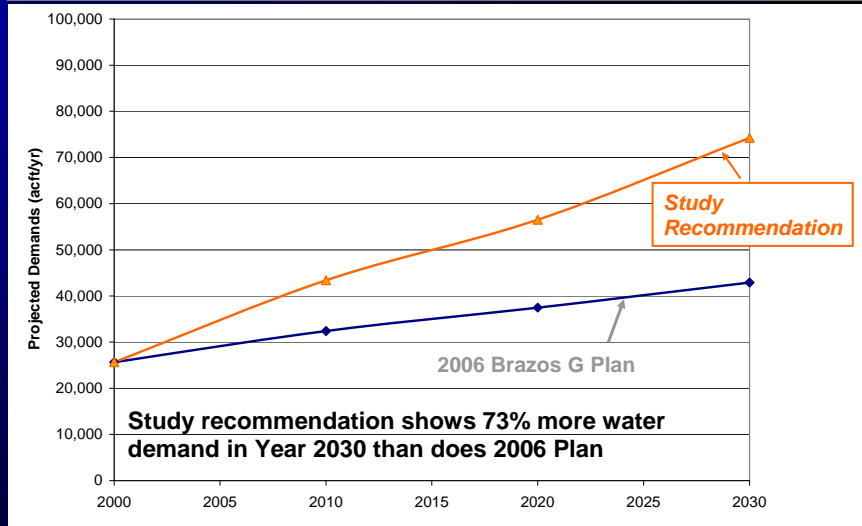
WUG	2006 Brazos G RWP Water Demand Projections			Recommended Draft Water Demand Projections (4 County Study)			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
<b>Johnson County- Municipal Water Demands</b>	<b>26,359</b>	<b>31,014</b>	<b>36,048</b>	<b>29,577</b>	<b>44,379</b>	<b>60,516</b>	<b>12%</b>	<b>43%</b>	<b>68%</b>
<b>Johnson County- Non Municipal Water Demands</b>									
Johnson County- Manufacturing <sup>c</sup>	372	374	376	374	376	378	1%	1%	1%
Johnson County- Manufacturing (Cleburne) <sup>c</sup>	1,749	2,143	2,527	2,758	4,883	6,148	58%	128%	143%
Johnson County- Mining <sup>d</sup>	370	390	403	4,371	878	1,217	1081%	125%	202%
Johnson County- Mining (Cleburne) <sup>d</sup>	0	0	0	1,009	673	673	N/A	N/A	N/A
Johnson County- Steam Electric	0	0	0	0	0	0	0%	0%	0%
Johnson County- Steam Electric (Cleburne) <sup>e</sup>	1,200	1,200	1,200	2,959	2,959	2,959	147%	147%	147%
Johnson County- Irrigation	240	240	240	240	240	240	0%	0%	0%
Johnson County- Livestock	2,117	2,117	2,117	2,117	2,117	2,117	0%	0%	0%
<b>Johnson County Total (Municipal and Non-Municipal)</b>	<b>32,407</b>	<b>37,478</b>	<b>42,911</b>	<b>43,405</b>	<b>56,505</b>	<b>74,248</b>	<b>34%</b>	<b>51%</b>	<b>73%</b>

<sup>c</sup> Brazos G 2006 Plan Johnson County manufacturing demand split between Johnson County and Cleburne.  
<sup>d</sup> Johnson County- Mining increased to account for mining demands as a result of development of Barnett Shale.  
<sup>e</sup> Brazos G 2006 Plan Johnson County- steam electric demand classified as being supplied by Cleburne.

All units are in acre-feet per year.



## Johnson County Demand Projections



11



## Summary of Population and Water Demand Projections

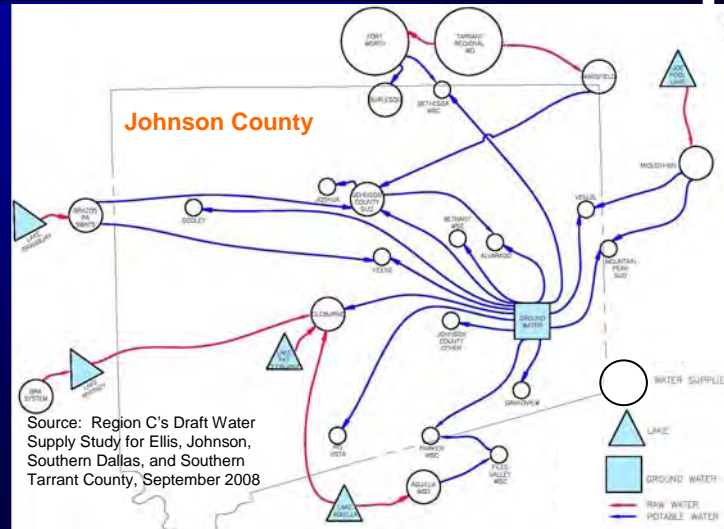
- ✓ Based on local input and State Data Center projections:
  - Population projections greater than in 2006 Plan for most Johnson County water user groups
  - Municipal demands generally greater
- ✓ City of Mansfield anticipates most of their future growth to occur in Johnson County
- ✓ Mining demand increases based on TWDB Barnett Shale study
- ✓ Higher Manufacturing and Steam-Electric demands anticipated based on information provided by City of Cleburne



12



## Existing Water Supplies- Johnson County



## Brazos River Authority- Major Wholesale Water Provider in Johnson County

- ✓ Brazos River Authority
  - Acton MUD
  - Aquilla WSD
    - ✓ Parker WSC (through Files Valley WSC)
  - City of Cleburne
  - Johnson County SUD
  - Keene

## Other Key Water Providers in Johnson County

- ✓ City of Cleburne
  - In-city municipal customers
  - Non-municipal customers (Johnson County Manufacturing, Steam-Electric, Mining)
  
- ✓ Johnson County Special Utility District
  - Municipal customers within service area
  - City of Joshua
  - City of Alvarado
  - Johnson County Mining



15



## Brazos River Authority Projected Demand (Needs Met)

Brazos River Authority	2010	2020	2030
<b>Demands (BASED ON MEETING NEEDS WHEN THEY OCCUR)</b>			
<b>Existing Customer Demand (Acre-Feet)</b>			
Acton MUD	1,126	1,618	2,083
Aquilla WSD & Customers			
Brandon-Irene WSC	188	191	195
Files Valley WSC and Customers	609	618	632
Cleburne	14,490	13,980	13,470
Johnson County SUD	6,612	5,809	9,263
Keene	524	609	702
<b>TOTAL EXISTING CUSTOMERS</b>	<b>23,549</b>	<b>22,825</b>	<b>26,345</b>
<b>Potential Customer Demand (Acre-Feet)</b>			
Bethany WSC (through Keene)	271	169	77
Parker WSC*	0	0	0
Godley	141	180	224
Grandview	100	151	212
Rio Vista	54	61	69
Johnson County-Other	2236	2210	2326
<b>TOTAL POTENTIAL CUSTOMERS</b>	<b>2,802</b>	<b>2,771</b>	<b>2,908</b>
<b>TOTAL NON-SWATS DEMAND</b>	<b>15,287</b>	<b>14,789</b>	<b>14,297</b>
<i>SWATS Demands (for Existing Customers)</i>	<i>8,262</i>	<i>8,036</i>	<i>12,048</i>
<i>SWATS Demands (for Existing and Proposed Customers)</i>	<i>11,064</i>	<i>10,807</i>	<i>14,956</i>
<b>TOTAL DEMAND</b>	<b>26,351</b>	<b>25,596</b>	<b>29,253</b>

\* Parker WSC have sufficient supplies from other sources to meet demands



16





## Brazos River Authority Projected Demand (Maximum Need from 2010 to 2030)

Brazos River Authority	2010	2020	2030
<b>Demands (GENERALLY BASED ON MAXIMUM NEED FROM 2010 - 2030 FOR POTENTIAL CUSTOMERS AND CONTRACTS FOR EXISTING CUSTOMERS)</b>			
<b>Existing Customer Demand (Acre-Feet)</b>			
Acton MUD	3,098	4,585	4,585
Aquilla WSD & Customers			
Brandon-Irene WSC	293	270	248
Files Valley WSC and Customers	1,063	985	907
Cleburne	19,673	19,084	18,495
Johnson County SUD	6,612	9,786	9,786
Keene	757	1,121	1,121
<b>TOTAL EXISTING CUSTOMERS DEMAND</b>	<b>31,496</b>	<b>35,831</b>	<b>35,142</b>
<b>Potential Customer Demand (Acre-Feet)</b>			
Bethany WSC (through Keene)	271	271	271
Parker WSC*	181	181	181
Godley	224	224	224
Grandview	212	212	212
Rio Vista	69	69	69
Johnson County-Other	2,326	2,326	2,326
<b>TOTAL POTENTIAL CUSTOMER DEMAND</b>	<b>3,283</b>	<b>3,283</b>	<b>3,283</b>
<b>TOTAL NON-SWATS DEMAND</b>	<b>21,029</b>	<b>20,339</b>	<b>19,650</b>
<b>SWATS Demands (for Existing Customers)</b>	<b>10,467</b>	<b>15,492</b>	<b>15,492</b>
<b>SWATS Demands (for Existing and Proposed Customers)</b>	<b>13,750</b>	<b>18,775</b>	<b>18,775</b>
<b>TOTAL DEMAND</b>	<b>34,779</b>	<b>39,114</b>	<b>38,425</b>



17



## Brazos River Authority Water Supplies

Brazos River Authority	2010	2020	2030
<b>Currently Contracted Raw Water Supplies (Acre-Feet)</b>			
Lake Aquilla (Cleburne)	5,300	5,300	5,300
Lake Aquilla (Aquilla WSD)	5,953	5,953	5,953
Lake Whitney (Cleburne)	9,700	9,700	9,700
Lake Granbury (Johnson County SUD)	13,210	13,210	13,210
Lake Granbury (Acton MUD)	7,000	7,000	7,000
Lake Granbury (Keene)	2,040	2,040	2,040
<b>TOTAL NON-SWATS SUPPLIES</b>	<b>20,953</b>	<b>20,953</b>	<b>20,953</b>
<b>TOTAL SWATS SUPPLIES</b>	<b>22,250</b>	<b>22,250</b>	<b>22,250</b>
<b>TOTAL SUPPLIES</b>	<b>43,203</b>	<b>43,203</b>	<b>43,203</b>

	Current Production (acre-feet)		Design Capacity (BRA planning to meet this goal)
	Average	Maximum	
<b>BRA SWATS Treated Water Capacity (Johnson County Only)</b>	10,468	12,960	15,492
<b>SWATS Treated Water Contracts</b>			
Acton MUD	3,098	3,835	4,585
JCSUD	6,612	8,187	9,786
Keene	757	938	1,121
<b>Total</b>	<b>10,468</b>	<b>12,960</b>	<b>15,492</b>



18



## Brazos River Authority Surplus (+) or Shortage (-)

Brazos River Authority	2010	2020	2030
<b>SURPLUS OR SHORTAGE (Based on Meeting Needs When They Occur)(Acre-Feet)</b>			
SURPLUS OR SHORTAGE (-) For BRA Non-SWATS Contracts	5,666	6,164	6,656
<b>SURPLUS OR SHORTAGE (-) For BRA SWATS Current and Potential Customers</b>			
SURPLUS OR SHORTAGE (-) With Average Current Production	-596	-339	-4,488
SURPLUS OR SHORTAGE (-) With Maximum Current Production	1,896	2,153	-1,996
SURPLUS OR SHORTAGE (-) With Design Capacity Production	4,428	4,685	536
<b>SURPLUS OR SHORTAGE (Based on Maximum Needs from 2010 to 2030 and Contracts) (Acre-Feet)</b>			
SURPLUS OR SHORTAGE (-) For BRA Non-SWATS Contracts	-76	614	1,303
<b>SURPLUS OR SHORTAGE (-) For BRA SWATS Current and Potential Customers</b>			
SURPLUS OR SHORTAGE (-) With Average Current Production	-3,282	-8,307	-8,307
SURPLUS OR SHORTAGE (-) With Maximum Current Production	-790	-5,815	-5,815
SURPLUS OR SHORTAGE (-) With Design Capacity Production	1,742	-3,283	-3,283



19



## City of Cleburne Projected Demand and Supplies (Draft)

City of Cleburne	2010	2020	2030
<b>Existing Customer Demand (Acre-Feet)</b>			
In-City Municipal Demand	6,244	7,802	9,753
Johnson County Industrial	2,758	4,883	6,148
Johnson County Steam Electric	2,959	2,959	2,959
Johnson County Mining	1,009	673	673
<b>TOTAL DEMAND</b>	<b>12,970</b>	<b>16,317</b>	<b>19,533</b>
<b>Currently Contracted Supplies (Acre-Feet)</b>			
Lake Pat Cleburne	5,183	5,104	5,025
BRA Lake Aquilla	4,790	4,280	3,770
BRA Lake Whitney	9,700	9,700	9,700
Reuse for Steam Electric	1,344	1,344	1,344
Trinity Aquifer	1,120	1,120	1,120
Conservation	229	515	454
<b>TOTAL CURRENT SUPPLIES</b>	<b>22,366</b>	<b>22,063</b>	<b>21,413</b>
<b>Recommended Supply Strategies (Ac-Ft)</b>			
Reuse	2,375	3,058	4,682
BRA System	0	1,020	1,530
<b>TOTAL SUPPLY (with WMS)</b>	<b>24,741</b>	<b>26,141</b>	<b>27,625</b>
<b>SURPLUS WITH RECOMMENDED STRATEGIES</b>	<b>11,771</b>	<b>9,824</b>	<b>8,092</b>



NOTE: Cleburne has contract with BRA for 5,300 acft/yr from Lake Aquilla. Supplies included in table are based on Lake Aquilla firm yield in 2006 Plan, and subject to revision.



## Johnson County SUD Projected Demand and Supplies (Draft)

Johnson County SUD	2010	2020	2030
<b>Existing Customer Demand (Acre-Feet)</b>			
Ellis County	27	52	82
Hill County	20	39	61
Johnson County	5,963	11,571	18,100
Tarrant County	263	511	800
Alvarado	469	469	469
Johnson County FWSD (Joshua)	804	1,114	1,566
Johnson County Mining	561	561	561
<b>TOTAL EXISTING CUSTOMERS</b>	<b>8,107</b>	<b>14,317</b>	<b>21,639</b>
<b>Potential Customer Demand (Acre-Feet)</b>			
Bethany WSC	112	224	336
Grand Prairie	3,363	0	0
Potential Loss of Ellis County Connections	-27	-52	-82
Potential Loss of Connections to Ft Worth	0	-100	-102
Potential Loss of Connections to Burleson	0	-100	-103
<b>TOTAL DEMAND</b>	<b>11,555</b>	<b>14,288</b>	<b>21,689</b>
<b>Currently Contracted Supplies (Acre-Feet)</b>			
BRA SWATS (Region C)	231	231	231
BRA SWATS (Region G)	6,381	9,555	9,555
Trinity Aquifer (Region C)	1	0	0
Trinity Aquifer (Region G)	428	427	427
Water Conservation (Region C)	5	20	27
Water Conservation (Region G)	423	1,307	1,883
Mansfield (TRWD)	307	0	0
<b>TOTAL CURRENT SUPPLIES</b>	<b>7,776</b>	<b>11,540</b>	<b>12,123</b>
<b>Recommended Supply Strategies (Ac-Ft)</b>			
Temporary Overdraft Trinity Aquifer	723	0	0
Mansfield (TRWD)	3,056	3,363	6,726
Grand Prairie (groundwater)	0	3,363	3,363
<b>TOTAL SUPPLY (with WMS)</b>	<b>11,555</b>	<b>18,266</b>	<b>22,212</b>
<b>SURPLUS WITH RECOMMENDED STRATEGIES</b>	<b>0</b>	<b>3,977</b>	<b>523</b>



## Summary of Contracted Supplies and Recommended Strategies for Johnson County (Slide 1 of 3)

Water User	Currently Contracted Supplies	Recommended Strategies
Acton MUD	Trinity aquifer, BRA SWATS	None
Alvarado	Trinity aquifer, Johnson County SUD	Temporarily Overdraft Trinity aquifer, Midlothian (TRWD) water through TRA), additional Johnson County SUD
Bethany WSC	Trinity aquifer	Keene (BRA SWATS), JCSUD
Bethesda WSC	Fort Worth (TRWD), Trinity aquifer	Arlington (TRWD), additional Fort Worth (TRWD), supplemental wells
Burleson	Fort Worth (TRWD)	None
Cleburne	Lake Pat Cleburne, BRA Lake Aquilla, BRA Lake Whitney (not yet connected), Trinity aquifer, Reuse (for Steam Electric)	Additional reuse, development of Lake Whitney supply from BRA System Operations
Godley	Trinity aquifer	BRA SWATS (possibly through JCSUD)



### Summary of Contracted Supplies and Recommended Water Strategies for Johnson County (Slide 2 of 3)

Water User	Currently Contracted Supplies	Recommended Strategies
Grandview	Woodbine aquifer	BRA SWATS (possibly through JCSUD)
Johnson County SUD	BRA SWATS, Trinity aquifer, Mansfield (TRWD)	Grand Prairie (groundwater), additional Mansfield (TRWD)
Joshua	Johnson County SUD	None
Keene	Trinity aquifer, BRA SWATS	Temporary overdraft Trinity aquifer (2010)
Mansfield	TRWD	None
Mountain Peak SUD	Trinity aquifer, Midlothian	Additional Trinity and Woodbine aquifer (new wells)
Parker WSC	Trinity aquifer, Files Valley WSC (Aquila WSD)	BRA SWATS (possibly through Johnson County SUD), Additional Trinity aquifer (new wells)
Rio Vista	Trinity aquifer	Temporary overdraft of Trinity aquifer (2010), BRA SWATS (possibly through JCSUD)
Venus	Midlothian (TRWD), Woodbine aquifer, Trinity aquifer	None



### Summary of Contracted Supplies and Recommended Water Strategies for Johnson County (Slide 3 of 3)

Water User	Currently Contracted Supplies	Recommended Strategies
Johnson County- Other	Trinity aquifer, Woodbine aquifer	BRA Main Steam Lake Reservoir (possibly through JCSUD)
Johnson County Manufacturing	Cleburne, Trinity aquifer	Direct Reuse
Johnson County Steam-Electric	Cleburne	Direct reuse
Johnson County Mining	Local supplies, Johnson County SUD, Trinity aquifer, Cleburne	BRA Main Stem Lake/Reservoir, Mansfield
Johnson County Irrigation	Local supplies, Trinity aquifer	None
Johnson County Livestock	Local supplies, Trinity aquifer	None



## Cost and Supply for Recommended Water Management Strategies for Johnson County (Draft)

Water Supplier	Water Management Strategy	Date Assumed	Cost	Supply
	5 MGD Treatment Plant Expansion	2013	\$12,121,000	2,803
	1.9 MGD Lake Whitney Desalination Plant	2015	\$36,911,000	2,129
	1.9 MGD Lake Whitney Expansion (3.8 MGD total)	2020	\$20,758,000	2,129
Cleburne	West Loop Reuse Pipeline	2010	\$8,664,000	1,682
Johnson County SUD	Connection to Mansfield (6 MGD) and Connection to Grand Prairie*	2010 - 2020	\$43,946,000	10,878
	Trinity Wells	2010	\$1,890,000	444
Alvarado	Connection to Midlothian	2030	\$11,140,000	1,121
	Connection to Keene	2010	\$4,332,000	271
Bethany WSC	Connection to Johnson County SUD	2010	\$4,799,000	336
	Additional Connection to Ft Worth	2010	In Progress	
Bethesda WSC	Connection to Arlington	2020	\$15,964,000	2,803
Burleson	Additional Connection to Ft Worth	Before 2020	\$24,530,000	-
Godley	Connection to SWATS (through JCSUD)	2010	\$4,067,000	224
Grandview	Connection to SWATS (through JCSUD)	2010	\$3,860,000	212
Mountain Peak	Additional Trinity Wells	2010	\$4,946,000	300
SUD	Additional Woodbine Wells	2010	\$2,282,000	50
Parker WSC	Connection to SWATS (through JCSUD)	2010	\$4,360,000	181
Rio Vista	Connection to Johnson County SUD	2010	\$3,260,000	69
Johnson County Other	Connection to SWATS (through JCSUD)	2010	\$14,073,000	2,326

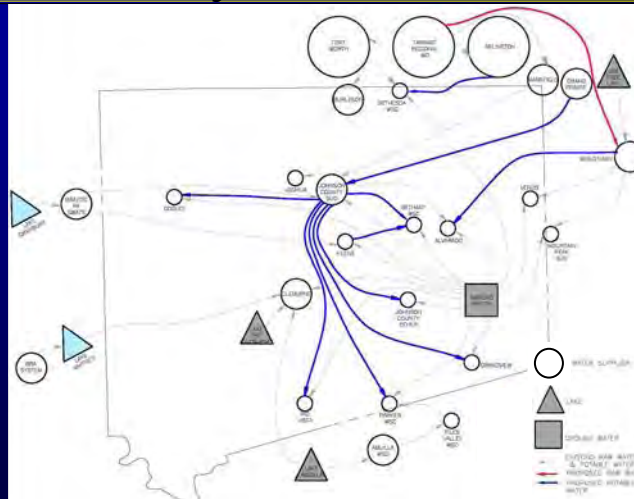
\* Note: Grand Prairie and Johnson County SUD will share cost of developing this connection. This is total cost.



Values in table are subject to change.



## Existing and Proposed Supplies for Johnson County



Note: Godley, Rio Vista, Parker WSC, Grandview, and Johnson County-Others planned to receive future supplies from BRA SWATS (through Johnson County SUD)



# Schedule

Four County Study Project Activities for Johnson County	Significant Project Milestones for Brazos G Project Involvement																	
	2007					2008												
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
Update to Brazos G RWPG (Oct 29, 2008)																		◆
Draft Four County Study Report to WUGs, WWPs, Brazos G planning group (Nov 10, 2008)																		◆
Meet with Johnson County WUGs and WWPs (Nov 25, 2008)																		◆
Receive comments from Johnson County (Brazos G) interests																		◆
Present Draft Four County Study Report to Brazos G RWPG for public comment (Dec 2008)																		◆
Submit final, approved activity/coordination report to TWDB (Dec 31, 2008)																		◆



# Questions?



***Attachment C***  
***Population and Water Demand Projections***  
***for Johnson County Water Users***

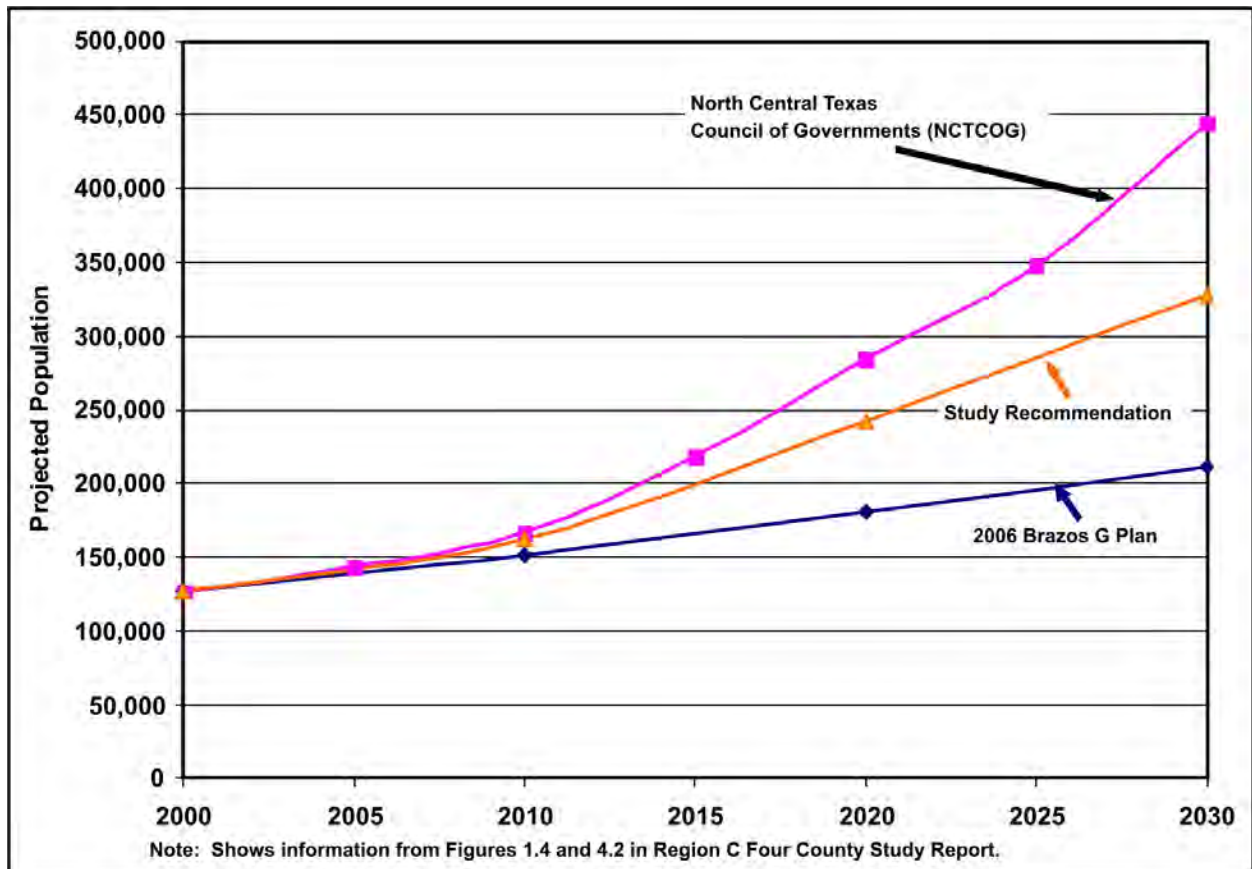
(Graphs and figures obtained from Draft Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County, November 2008)





**Table C-1.**  
**Summary of Johnson County Population and Demand Projections**

	2000 Historical	2010	2020	2030
<b>Johnson County Population Projections</b>				
2006 Brazos G Regional Water Plan	126,811	151,468	180,509	211,020
NCTCOG	126,811	166,759	284,411	444,151
Recommended	126,811	162,236	242,627	327,898
Recommended Increase from the 2006 Plan		10,768	62,118	116,878
<b>Johnson County Demand Projections (acft/yr)</b>				
2006 Brazos G Regional Water Plan		32,407	37,478	42,911
Recommended		43,405	56,505	74,248
Recommended Increase from the 2006 Plan		10,998	19,027	31,337



**Figure C-1. Population Projections for Johnson County**

**Table C-2.**  
**Estimated 2007 Populations for Johnson County Cities**

<b>City</b>	<b>2000 Census Population<sup>(7)</sup></b>	<b>State Data Center Estimated 2007 Population<sup>(8)</sup></b>	<b>% Average Annual Growth Rate</b>
Alvarado	3,288	4,087	3.16%
Burleson*	17,514	27,329	6.56%
Cleburne	26,005	29,567	1.85%
Godley	879	1,061	2.72%
Grandview	1,358	1,543	1.84%
Joshua	4,528	5,299	2.27%
Keene	5,003	5,971	2.56%
Mansfield*	622	867	4.86%
Rio Vista	656	768	2.28%
Venus	1,892	2,435	3.67%
Rural County-Other	65,066	74,372	1.93%
County Total	126,811	153,299	2.75%

Notes: Some of the population in these communities is located in neighboring counties. Only the population for the portion of the entity located in Johnson County is shown here. Most of the areas outside city limits are supplied by special utility districts and water supply corporations. Rural County-Other is served by water supply corporations, special utility districts, and cities with population less than 500 people. County-Total includes city population and rural unincorporated areas within the county.

**Table C-3.**  
**Population Projections for Johnson County Water User Groups**

Johnson County WUG	2006 Brazos G RWP Population Projections			Recommended Draft Population Projections for Four County Study			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Acton MUD (P)	133	171	211	133	171	211	0%	0%	0%
Alvarado	3,595	3,957	4,337	4,439	7,535	10,766	23%	90%	148%
Bethany WSC	3,373	3,813	4,275	4,300	4,500	4,750	27%	18%	11%
Bethesda WSC (P)	19,035	24,199	29,625	19,035	24,199	29,625	0%	0%	0%
Burleson (P)	20,303	23,588	27,039	27,206	42,037	52,747	34%	78%	95%
Cleburne	29,158	32,872	36,774	30,946	38,683	48,353	6%	18%	31%
Godley	1,136	1,439	1,757	1,136	1,439	1,757	0%	0%	0%
Grandview	1,452	1,562	1,678	1,600	2,000	2,500	10%	28%	49%
Johnson County SUD (P) and JCFWSD #1	43,983	56,147	68,926	32,281	62,090	94,540	-27%	11%	37%
Joshua	5,114	5,805	6,531	5,523	7,895	11,369	8%	36%	74%
Keene	5,882	6,917	8,004	5,882	6,917	8,004	0%	0%	0%
Mansfield (P)	626	631	636	10,833	23,472	37,827	1631%	3620%	5848%
Mountain Peak SUD (P)	1,733	2,360	3,019	1,979	3,039	4,460	14%	29%	48%
Parker WSC (P)	2,187	2,697	3,233	2,311	2,396	2,481	6%	-11%	-23%
Rio Vista	751	863	981	751	863	981	0%	0%	0%
Venus (P)	1,892	1,892	1,892	2,766	3,795	5,425	46%	101%	187%
County-Other	11,115	11,596	12,102	11,115	11,596	12,102	0%	0%	0%
<i>Johnson County Total</i>	151,468	180,509	211,020	162,236	242,627	327,898	7%	34%	55%
<p>Note: TWDB 2006 Brazos G Plan JCFWSD #1 projections of 6,437 (2010) and 7,750 (2020), and 9,129 (2030) added to Johnson County SUD.</p> <p>Acton MUD, Bethesda WSC, Godley, Keene, Rio Vista, and Johnson County-Other have no changes recommended.</p>									

**Table C-4.**  
**Municipal Per Capita Use Projections for Johnson County Water User Groups**

Johnson County WUG	2006 Brazos G RWP Per Capita Projections (gpcd)			Recommended Draft gpcd Projections for Four County Study			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Acton MUD	144	141	139	143	141	139	-1%	0%	0%
Alvarado	121	117	115	121	117	115	0%	0%	0%
Bethany WSC	96	93	90	98	95	94	2%	2%	4%
Bethesda WSC	129	126	124	129	126	124	0%	0%	0%
Burleson	146	142	140	165	161	159	13%	13%	14%
Cleburne	176	173	170	180	180	180	2%	4%	6%
Godley	131	128	127	131	128	127	0%	0%	0%
Grandview	128	125	122	128	125	122	0%	0%	0%
Johnson County SUD	167	164	162	164	166	171	-2%	1%	6%
Joshua	130	126	123	130	126	123	0%	0%	0%
Keene	94	91	89	94	91	89	0%	0%	0%
Mansfield	235	243	241	220	218	216	-6%	-10%	-10%
Mountain Peak SUD	161	159	158	149	147	146	-7%	-8%	-8%
Parker WSC	117	114	111	117	114	111	0%	0%	0%
Rio Vista	84	80	77	84	80	77	0%	0%	0%
Venus	133	131	128	170	170	170	28%	30%	33%
County-Other	223	221	219	223	221	219	0%	0%	0%

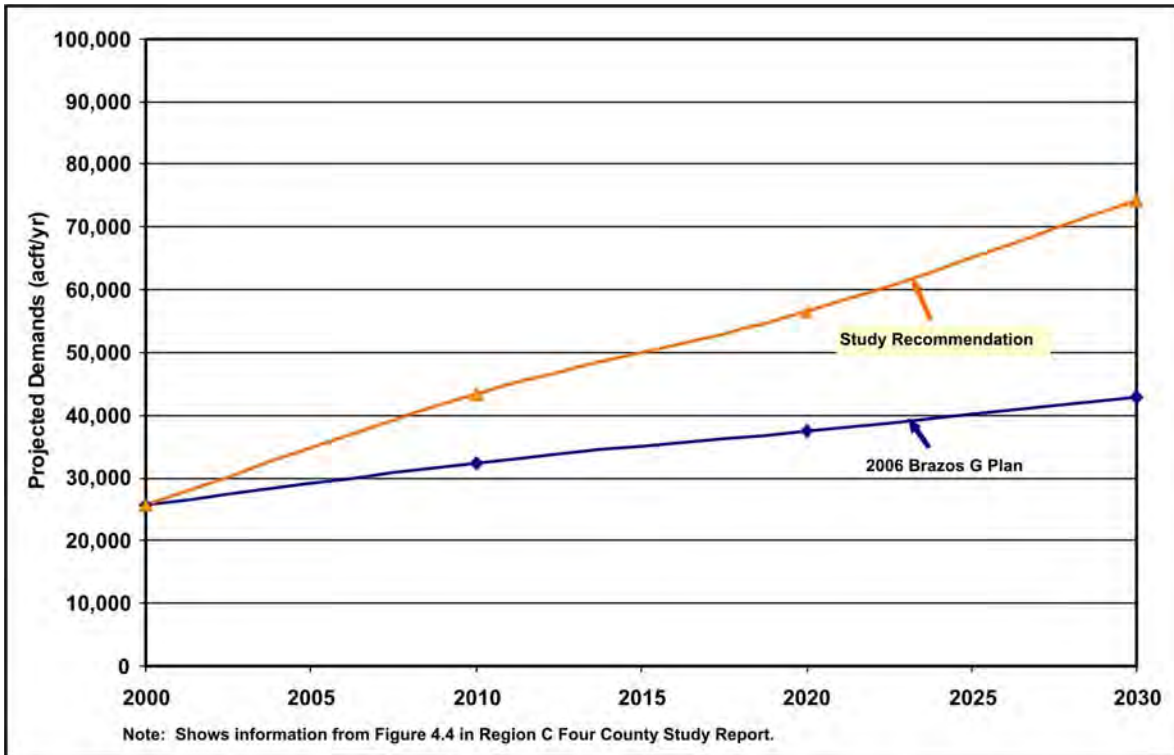


Figure C-2. Comparison of Average Day Water Demand Projections for Johnson County (by Source)

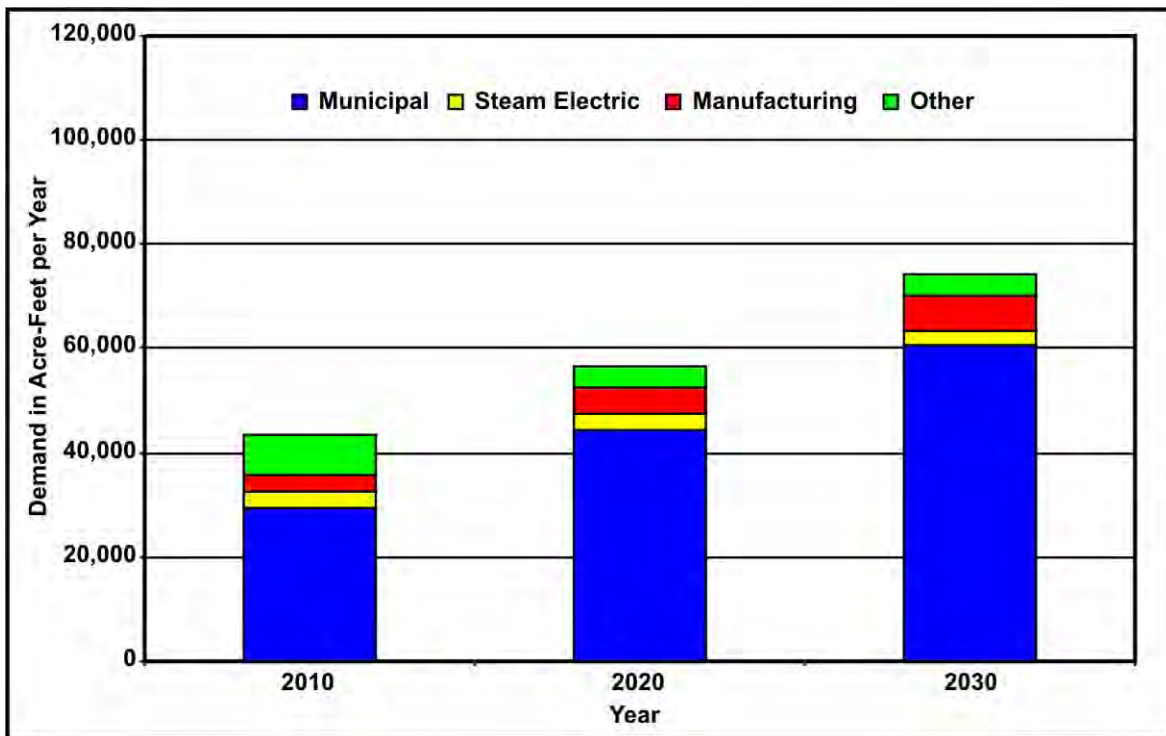


Figure C-3. Recommended Average Day Water Demand Projections by Category for Johnson County (Source Figure 4.6 from Region C Study)

**Table C-5.**  
**Municipal Water Demand Projections in Johnson County (by Water User Group)**

Johnson County WUG	2006 Brazos G RWP Water Demand Projections (acft/yr)			Recommended Draft Water Demand Projections for Four County Study(acft/yr)			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Acton MUD (P)	21	27	33	21	27	33	0%	0%	0%
Alvarado	487	519	559	602	988	1,387	24%	90%	148%
Bethany WSC	363	397	431	470	480	500	29%	21%	16%
Bethesda WSC (P)	2,751	3,415	4,115	2,751	3,415	4,115	0%	0%	0%
Burleson (P)	3,320	3,752	4,240	5,029	7,582	9,395	51%	102%	122%
Cleburne <sup>a</sup>	5,748	6,370	7,003	6,244	7,802	9,753	9%	22%	39%
Godley	167	206	250	167	206	250	0%	0%	0%
Grandview	208	219	229	229	280	341	10%	28%	49%
Johnson County SUD (P) and JCFWSD #1 <sup>b</sup>	8,036	10,423	13,058	5,963	11,571	18,100	-26%	11%	39%
Joshua	744	819	899	804	1,114	1,566	8%	36%	74%
Keene	620	705	798	620	705	798	0%	0%	0%
Mansfield (P)	165	172	172	2,670	5,732	9,153	1518%	3233%	5222%
Mountain Peak SUD (P)	313	420	534	330	500	730	5%	19%	37%
Parker WSC (P)	287	344	402	303	306	308	6%	-11%	-23%
Rio Vista	71	77	85	71	77	85	0%	0%	0%
Venus (P)	282	278	271	527	723	1,033	87%	160%	281%
County-Other	2,776	2,871	2,969	2,776	2,871	2,969	0%	0%	0%
<i>Johnson County Municipal Total</i>	26,359	31,014	36,048	29,577	44,379	60,516	12%	43%	68%

a Note: Cleburne water demand projections from 4 county study subject to revision.

b TWDB 2006 Brazos G Plan JCFWSD #1 projections of 844 acft/yr (2010) and 990 acft/yr (2020), and 1,135 (2030) added to Johnson County SUD projections of 7,192 acft/yr (2010) and 9,433 acft/yr (2020) and 11,923 acft/yr (2030).

**Table C-6.**  
**Municipal and Non-Municipal Water Demand Projections in Johnson County**

Johnson County WUG	2006 Brazos G RWP Water Demand Projections (acft/yr)			Recommended Draft Water Demand Projections for Four County Study(acft/yr)			% Difference		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Johnson County- Municipal Water Demands	26,359	31,014	36,048	29,577	44,379	60,516	12%	43%	68%
Non-Municipal									
Johnson County- Manufacturing <sup>c</sup>	372	374	376	374	376	378	1%	1%	1%
Johnson County- Manufacturing (Cleburne) <sup>c</sup>	1,749	2,143	2,527	2,758	4,883	6,148	58%	128%	143%
Johnson County- Mining <sup>d</sup>	370	390	403	4,371	878	1,217	1081%	125%	202%
Johnson County- Mining (Cleburne) <sup>d</sup>	0	0	0	1,009	673	673	N/A	N/A	N/A
Johnson County- Steam Electric	0	0	0	0	0	0	0%	0%	0%
Johnson County- Steam Electric (Cleburne) <sup>e</sup>	1,200	1,200	1,200	2,959	2,959	2,959	147%	147%	147%
Johnson County- Irrigation	240	240	240	240	240	240	0%	0%	0%
Johnson County- Livestock	2,117	2,117	2,117	2,117	2,117	2,117	0%	0%	0%
<i>Johnson County Total (Municipal and Non-Municipal)</i>	32,407	37,478	42,911	43,405	56,505	74,248	34%	51%	73%
<p>c Brazos G 2006 Plan Johnson County manufacturing demand split between Johnson County and Cleburne.</p> <p>d Johnson County- Mining increased to account for mining demands as a result of development of Barnett Shale.</p> <p>e Brazos G 2006 Plan Johnson County- steam electric demand classified as being supplied by Cleburne.</p>									

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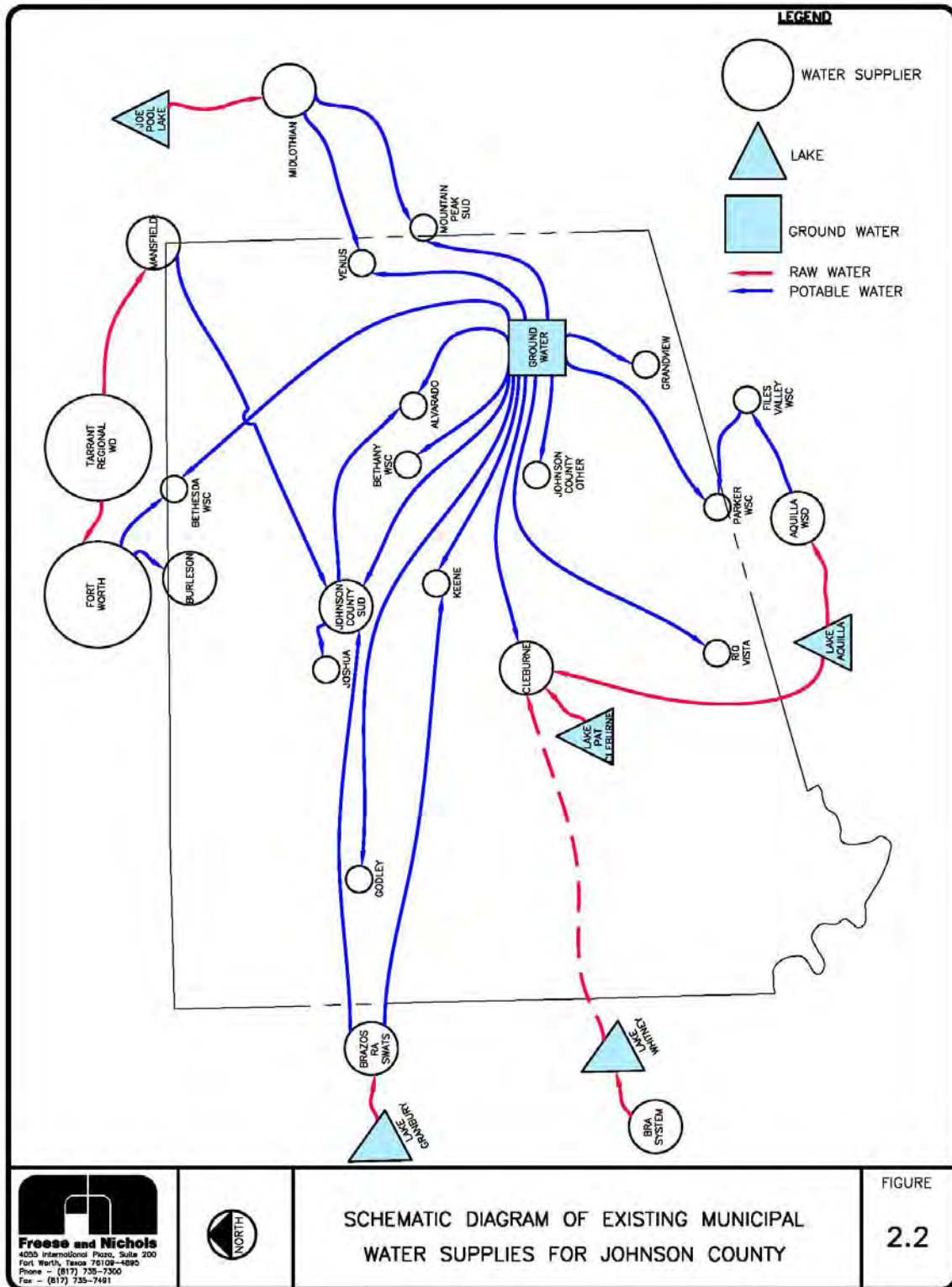
***Attachment D***  
***Current Water Supplies for Johnson County Water***  
***User Groups***

(Graphs and figures obtained from Draft Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County, September 2008)



**Table D-1.**  
**Current Water Supply Sources for Johnson County**

<b>Water User Group</b>	<b>Current Supplies</b>
Acton MUD	Trinity Aquifer, BRA SWATS
Alvarado	Trinity Aquifer, Johnson County SUD
Bethany WSC	Trinity Aquifer
Bethesda WSC	Fort Worth (TRWD), Trinity Aquifer
Burleson	Fort Worth (TRWD)
Cleburne	Lake Pat Cleburne, Lake Aquilla, Lake Whitney (contracted but not yet used), Trinity Aquifer, Reuse (for Steam Electric)
Godley	Trinity Aquifer
Grandview	Woodbine aquifer
Johnson County SUD	Brazos River Authority SWATS, Trinity Aquifer, Mansfield (TRWD)
Joshua	Johnson County SUD
Keene	Brazos River Authority SWATS, Trinity Aquifer
Mansfield	Tarrant Regional Water District
Mountain Peak SUD	Trinity Aquifer, Midlothian
Parker WSC	Trinity Aquifer, Files Valley WSC (Aquilla WSD)
Rio Vista	Trinity Aquifer
Venus	Midlothian (TRWD), Woodbine aquifer, Trinity Aquifer
Johnson County-Other	Trinity Aquifer, Woodbine aquifer
Johnson County Manufacturing	Cleburne, Trinity Aquifer
Johnson County Steam Electric	Cleburne
Johnson County Mining	Local Suppliers, Trinity Aquifer, Cleburne
Johnson County Irrigation	Local Suppliers, Trinity Aquifer
Johnson County Livestock	Local Suppliers, Trinity Aquifer



Source: Region C's Draft Water Supply Study for Ellis, Johnson, Southern Dallas, and Southern Tarrant County, November 2008.

**Figure D-1. Current Supplies for Study Area Water User Groups**

**Table D-2.  
Current and Future Supplies for Study Area Water User Groups**

Water User Group	Primary County	Other Counties	New Sources for Future?	Water Supply Sources											Reuse	Surface from Other Suppliers	Local Supplies	Comments
				Ground-water	Own Surface Water	TRA Reservoirs	TRWD		Dallas		BRA SWATS		Other BRA					
							Direct	Through Others	Direct	Through Others	Direct	Through Others	Direct	Through Others				
Cedar Hill	Dallas	Ellis		▲		▲				▲								Does not have plans to use TRA contract for Joe Pool Lake in near future.
Duncanville	Dallas					▲				▲								Does not have plans to use TRA contract for Joe Pool Lake in near future.
Grand Prairie	Dallas	Tarrant, Ellis	■	▲		▲		▲	▼									May get water from Dallas through Cedar Hill and TRWD through Arlington, Mansfield, and Midlothian.
Wilmer	Dallas		■	▲						▼								May get Dallas water through Hutchins or Lancaster.
Bardwell	Ellis		■	▲					▼									Will get TRWD water through Waxahachie.
Buena Vista-Bethel SUD	Ellis		■	▲					▼									Will get TRWD water through Waxahachie.
Community Water Company	Ellis							▲								▲		Supplies are from Ennis.
Ennis	Ellis					▲		▲							▲			
Ferris	Ellis		■	▲					▼							▲		Will get TRWD water through Rockett SUD.
Glenn Heights	Ellis	Dallas		▲						▲								
Italy	Ellis		■	▲					▼									Will get TRWD water through Waxahachie.
Maypearl	Ellis		■	▲					▼									Will get TRWD water through Waxahachie.
Midlothian	Ellis		■	▲		▲		▼										Will build plant to treat TRWD water.
Milford	Ellis			▲											▲			
Mountain Peak SUD	Ellis	Johnson	■	▲												▲		Plans to drill Woodbine wells.
Oak Leaf	Ellis		■	▲					▼							▲		May get TRWD water through Rockett SUD.
Ovilla	Ellis	Dallas		▲						▲								
Palmer	Ellis		■	▲					▼							▲		Will get TRWD water through Rockett SUD.
Pecan Hill	Ellis		■	▲					▲							▲		Rockett SUD currently provides all water supply to Pecan Hill.
Red Oak	Ellis		■	▲					▼		▲					▲		Will get TRWD water through Rockett SUD for portion of city located in Rockett SUD's CCN. Red Oak is purchasing wholesale treated water from Dallas.
Rockett SUD	Ellis	Dallas	■	▲				▼								▲		Will connect to TRWD with Sokoll plant.
Sardis-Lone Elm WSC	Ellis	Dallas	■	▲					▼									May get TRWD water through Rockett SUD.
Waxahachie	Ellis		■	▲	▲	▲		▼							▲			Will connect to TRWD with Sokoll plant.
Ellis County-Other	Ellis		■	▲				▼										May get TRWD water through Rockett SUD and Wax.
Ellis County Irrigation	Ellis		■	▲											▼		▲	
Ellis County Livestock	Ellis			▲													▲	
Ellis County Manufacturing	Ellis			▲		▲			▲							▲		Ennis, Midlothian, Waxahachie
Ellis County Mining	Ellis			▲													▲	
Ellis County Steam Electric Power	Ellis					▲									▲	▲		Ennis and Midlothian now. Waxahachie and TRA reuse future.
Brandon-Irene WSC	Hill	Ellis													▲			BRA Lake Aquilla from Aquilla WSC.
Files Valley WSC	Hill	Ellis													▲			Lake Aquilla water through Aquilla WSC.
Acton MUD	Hood	Johnson		▲						▲								
Alvarado	Johnson		■	▲					▼									May get TRWD water through Midlothian
Bethany WSC	Johnson		■	▲					▼									May get BRA SWATS water through Keene or JCSUD.
Bethesda WSC	Johnson	Tarrant	■	▲					▲									Has TRWD water through Fort Worth, will get from Arlington.
Burleson	Johnson	Tarrant							▲									TRWD water through Fort Worth.
Cleburne	Johnson		■	▲	▲								▲		▲			Will develop desalination to use BRA water from Whitney.
Godley	Johnson		■	▲									▼					May get BRA SWATS water through JCSUD.
Grandview	Johnson		■	▲									▼					May get BRA SWATS water through JCSUD.
Johnson County SUD	Johnson	Tarrant, Ellis	■	▲					▲		▲							Additional TRWD water via Mansfield. Will get Grand Prairie water.
Joshua	Johnson		■	▲					▲		▲							Supplied by Johnson County SUD.
Keene	Johnson			▲						▲								
Parker WSC	Johnson	Hill	■	▲							▼			▲				Will get BRA SWATS water through JCSUD.
Rio Vista	Johnson		■	▲									▼					May get BRA SWATS water through JCSUD.
Venus	Johnson			▲					▼							▲		TRWD water from Midlothian.
Johnson County-Other	Johnson			▲										▼				Will get BRA SWATS water through JCSUD.
Johnson County Irrigation	Johnson			▲													▲	
Johnson County Livestock	Johnson			▲													▲	
Johnson County Manufacturing	Johnson		■	▲										▲	▼	▲		Cleburne reuse.
Johnson County Mining	Johnson		■	▲									▼			▲		Cleburne reuse.
Johnson County Steam Electric	Johnson			▲										▲	▲	▲		
Rice WSC	Navarro	Ellis							▲							▲		
Kennedale	Tarrant		■	▲					▼									TRWD water through Fort Worth.
Mansfield	Tarrant	Johnson, Ellis						▲										

Current sources shown with Blue Triangle = ▲  
Future sources shown with Red Triangle = ▼  
Recommended New Sources for Future = ■

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***Attachment E***  
***Recommended Water Management Strategies for***  
***Johnson County Water User Groups***

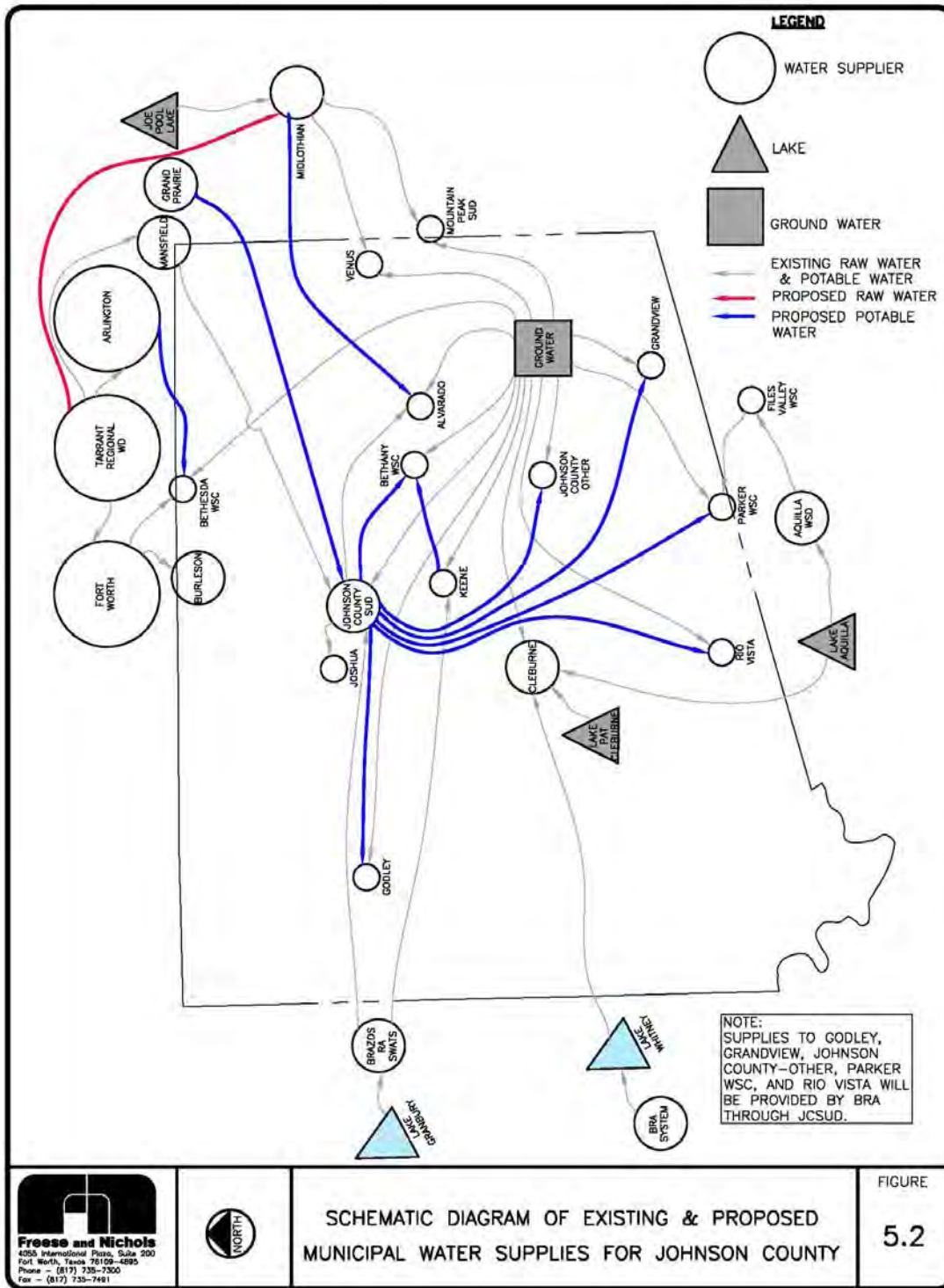
(Graphs and figures obtained from Draft Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County, September 2008)





**Table E-1.**  
**Summary of Recommended Water Management Strategies for Johnson County**

<b>Water User Group</b>	<b>Currently Contracted Supplies</b>	<b>Recommended Strategies</b>
Acton MUD	Trinity Aquifer, BRA SWATS	None
Alvarado	Trinity Aquifer, Johnson County SUD	Temporarily Overdraft Trinity Aquifer, Midlothian (TRWD water through TRA), additional Johnson County SUD
Bethany WSC	Trinity Aquifer	Keene (BRA SWATS), Johnson County SUD
Bethesda WSC	Fort Worth (TRWD), Trinity Aquifer	Arlington (TRWD), additional Fort Worth (TRWD), supplemental wells
Burleson	Fort Worth (TRWD)	None
Cleburne	Lake Pat Cleburne, BRA Lake Aquilla, BRA Lake Whitney (not yet connected), Trinity Aquifer, Reuse (for Steam Electric Power)	Additional reuse, development of Lake Whitney supply from BRA System Operations
Godley	Trinity Aquifer	BRA SWATS (possibly through JCSUD)
Grandview	Woodbine aquifer	BRA SWATS (possibly through JCSUD)
Johnson County SUD	BRA SWATS, Trinity Aquifer, Mansfield (TRWD)	Temporary overdraft of the Trinity Aquifer in 2010, Grand Prairie (groundwater), additional Mansfield (TRWD)
Joshua	Johnson County SUD	None
Keene	BRA SWATS, Trinity Aquifer	Temporary overdraft of the Trinity Aquifer in 2010
Mansfield	TRWD	None
Mountain Peak SUD	Trinity Aquifer, Midlothian	Additional Trinity Aquifer (new wells), Woodbine aquifer (new wells)
Parker WSC	Trinity Aquifer, Files Valley WSC (Aquilla WSD)	BRA SWATS (possibly through Johnson County SUD), supplemental wells in Trinity Aquifer
Rio Vista	Trinity Aquifer	Temporary overdraft of the Trinity Aquifer in 2010, BRA SWATS (possibly through Johnson County SUD)
Venus	Midlothian (TRWD), Wood-bine aquifer, Trinity Aquifer	None
Johnson County Other	Trinity Aquifer, Woodbine aquifer	BRA Main Stem Lake/Reservoir (possibly through JCSUD)
Johnson County Manufacturing	Cleburne, Trinity Aquifer	Direct Reuse
Johnson County Steam Electric	Cleburne	Direct Reuse
Johnson County Mining	Local Supplies, Trinity Aquifer, Cleburne	BRA Main Stem Lake/Reservoir
Johnson County Irrigation	Local Supplies, Trinity Aquifer	None
Johnson County Livestock	Local Supplies, Trinity Aquifer	None



Source: Region C's Draft Water Supply Study for Ellis, Johnson, Southern Dallas, and Southern Tarrant County, November 2008.

**Figure E-1. Current and Future Proposed Supplies for Study Area Water User Groups**

**Table E-2.**  
**Recommended Water Management Strategies for Johnson County Entities**

<b>Water Supplier</b>	<b>Water Management Strategy</b>	<b>Date Assumed</b>	<b>Cost</b>	<b>Supply (acft/yr)</b>
Alvarado	Trinity Wells	2010	\$1,890,000	444
	Connection to Midlothian	2010	\$11,140,000	1,121
Bethany WSC	Connection to Keene	2010	\$3,952,000	275
	Connection to Johnson County SUD	2010	\$4,360,000	336
Bethesda WSC	Additional Connection to Ft Worth	2010	In Progress	
	Connection to Arlington	2020	\$15,494,000	2,803
Burleson	Additional Connection to Ft Worth	Before 2020	\$24,530,000	-
Cleburne	5 Million Gallons per Day (MGD) Treatment Plant Expansion	2013	\$12,025,000	-
	1.9 MGD Lake Whitney Desalination Plant	2015	\$36,910,000	2,129
	1.9 MGD Lake Whitney Expansion (3.8 MGD total)	2020	\$23,618,000	2,129
	West Loop Reuse Pipeline	2010	\$8,589,000	3,027
Godley	Connection to SWATS (through JCSUD)	2010	\$3,638,000	224
Grandview	Connection to SWATS (through JCSUD)	2010	\$3,600,000	212
Johnson County SUD	Connection to Mansfield (6 MGD)	2010	\$24,999,000	6,726
	Connection to Grand Prairie*	2020	\$31,003,000	3,363
	Water Conservation	on going	-	1,910
Mountain Peak SUD	Additional Trinity Wells	2010	\$4,946,000	300
	Additional Woodbine Wells	2010	\$2,282,000	50
Parker WSC	Connection to SWATS (through JCSUD)	2010	\$3,467,000	181
Rio Vista	Connection to Johnson County SUD	2010	\$3,087,000	69
Johnson County Other	Connection to SWATS (through JCSUD)	2010	\$13,827,000	2,326
Note: Grand Prairie and Johnson County SUD will share cost of developing this connection. This is total cost. Costs provided above are reported in second quarter 2007 dollars.				

### ***Details of Water Management Strategies for Johnson County Municipal Water Users***

Alvarado is planning to purchase water from Midlothian, and Bethesda WSC is planning to purchase water from Arlington. Midlothian and Arlington will get raw water for these strategies from TRWD. Midlothian has indicated that they want Alvarado to purchase raw water from TRWD, so Midlothian does not have to commit its limited raw water resources to supply Alvarado. (Since Arlington is one of the TRWD's four primary customers, it has an "all needs met" contract with TRWD, which includes water for its wholesale customers. As a result, Bethesda WSC will probably purchase water directly from Arlington without a raw water contract with TRWD.) The Trinity River Authority (TRA) acts as the contracting agent for TRWD water supplies in Ellis County, and TRWD supports TRA acting in the same capacity for wholesale contracts with Johnson County entities. TRA is agreeable to this arrangement.

Population, water demand, and water management strategies for Johnson County regional and wholesale water providers are provided below for City of Cleburne, JCSUD, and BRA.

**Table E-3.**  
**Projected Demand and Contractual Supply for Cleburne**

	2010	2020	2030
<b>Existing Customer Demand (acft/yr)</b>			
In-City Municipal Demand	6,244	7,802	9,753
Johnson County Industrial	2,758	4,883	6,148
Johnson County Steam Electric	2,959	2,959	2,959
Johnson County Mining	1,009	673	673
<b>TOTAL DEMAND</b>	<b>12,970</b>	<b>16,317</b>	<b>19,533</b>
<b>Currently Contracted Supplies (acft/yr)</b>			
Lake Pat Cleburne	5,183	5,104	5,025
BRA Lake Aquilla	4,790	4,280	3,770
BRA Lake Whitney	9,700	9,700	9,700
Reuse for Steam Electric	1,344	1,344	1,344
Trinity Aquifer	1,120	1,120	1,120
Conservation	229	515	454
<b>TOTAL CURRENT SUPPLIES</b>	<b>22,366</b>	<b>22,063</b>	<b>21,413</b>
<b>SURPLUS OR SHORTAGE (-)</b>	<b>9,396</b>	<b>5,746</b>	<b>1,880</b>
<b>Recommended Supply Strategies (acft/yr)</b>			
Reuse	2,375	3,058	4,682
BRA System	0	1,020	1,530
<b>TOTAL RECOMMENDED SUPPLY STRATEGIES</b>	<b>2,375</b>	<b>4,078</b>	<b>6,212</b>
<b>TOTAL SUPPLY</b>	<b>24,741</b>	<b>26,141</b>	<b>27,625</b>
<b>SURPLUS WITH RECOMMENDED STRATEGIES</b>	<b>11,771</b>	<b>9,824</b>	<b>8,092</b>
Notes:			
a. Cleburne is going to build a desalination plant and delivery system to use water from Lake Whitney and the BRA system. The supply available from Lake Whitney will increase over time as the treatment plant is expanded to meet the City's needs. The treated water supply from the desalination plant will be less than the raw water supply. It is estimated that approximately 30% of the raw water supply will be discharged as reject water.			
b. The projected industrial, steam electric, and mining demands shown are all higher than assumed in the 2006 Brazos G Regional Water Plan. We recommend that the Johnson County Industrial, Steam Electric, and Mining demands be increased.			
c. The supply from the Trinity Aquifer is for Johnson County Manufacturing. This supply was not included in the 2006 Brazos G Plan because the supplies in the plan were allocated according to use and aquifer availability. The supply indicated in the above table may result in short-term overdrafting of the Trinity Aquifer in excess of the aquifer's availability depending on local pumping conditions. The available Trinity Aquifer supply to Cleburne may be different in the 2011 Plan.			
Source: Table 5-11 from Region C Four County Study.			

**Table E-4.**  
**Water Management Strategies for Cleburne**

<b>Water Management Strategy</b>	<b>Assumed Date</b>	<b>Capital Cost</b>	<b>Average Day Supply Made Available (acft/yr)</b>
West Loop Reuse Pipeline	2010	\$8,589,000	3,027
5 MGD Treatment Plant Expansion	2013	\$12,025,000	0
1.9 MGD Lake Whitney desalination Plant	2015	\$36,910,000	2,129
3.8 MGD Lake Whitney Plant Expansion and Pipeline to Cleburne	2020	\$23,618,000	2,129
Source: Table 5-12 from Region C Four County Study. Costs provided above are reported in second quarter 2007 dollars.			

**Table E-5.**  
**Projected Demand and Supply for Johnson County SUD**

	2010	2020	2030
<b>Existing Customer Demand (acft/yr)</b>			
Ellis County	27	52	82
Hill County	20	39	61
Johnson County	5,693	11,571	18,100
Tarrant County	263	511	800
Alvarado	469	469	469
Johnson County FWSD (Joshua)	804	1,114	1,566
Johnson County Mining	561	561	561
<b>TOTAL EXISTING CUSTOMERS</b>	<b>8,107</b>	<b>14,317</b>	<b>21,639</b>
<b>Potential Customer Demand (acft/yr)</b>			
Bethany WSC	112	224	336
Grand Prairie	3,363	0	0
Potential Loss of Ellis County Connections	-27	-52	-82
Potential Loss of Connections to Fort Worth	0	-100	-102
Potential Loss of Connections to Burleson	0	-100	-102
<b>TOTAL DEMAND</b>	<b>11,555</b>	<b>14,289</b>	<b>21,689</b>
<b>Currently Contracted Supplies (acft/yr)</b>			
BRA SWATS (Region C)	231	231	231
BRA SWATS (Region G)	6,381	9,555	9,555
Trinity Aquifer (Region C)	1	0	0
Trinity Aquifer (Region G)	428	427	427
Water Conservation (Region C)	5	20	27
Water Conservation (Region G)	423	1,307	1,883
Mansfield (TRWD)	307	0	0
<b>TOTAL CURRENT SUPPLIES</b>	<b>7,776</b>	<b>11,540</b>	<b>12,123</b>
<b>SURPLUS OR SHORTAGE (-)</b>	<b>-331</b>	<b>-2,777</b>	<b>-9,516</b>
<b>Recommended Supply Strategies (acft/yr)</b>			
Temporary overdraft of Trinity Aquifer	723	0	0
Mansfield (TRWD)	3,056	3,363	6,726
Grand Prairie (groundwater)	0	3,363	3,363
<b>TOTAL RECOMMENDED SUPPLY STRATEGIES</b>	<b>3,779</b>	<b>6,726</b>	<b>10,089</b>
<b>TOTAL SUPPLY</b>	<b>11,555</b>	<b>18,266</b>	<b>22,212</b>
<b>SURPLUS WITH RECOMMENDED STRATEGIES</b>	<b>0</b>	<b>3,977</b>	<b>523</b>
Notes: Johnson County SUD is currently negotiating contracts for water with Mansfield and Grand Prairie. Parker WSC, Godley, Grandview, and Rio Vista may purchase water directly from BRA SWATS in the future. Johnson County SUD may provide water treatment for these entities.			
Source: Table 5-13 from Region C Four County Study.			

**Table E-6.**  
**Water Management Strategies for Johnson County SUD**

<b>Management Strategy</b>	<b>Date Assumed in Place</b>	<b>Cost</b>	<b>Supply Made Available (acft/yr)</b>
Connection to Mansfield (6 MGD)	2010	\$24,999,000	6,726
Connection to Grand Prairie*	2020	\$31,003,000	3,363
Conservation	on going	-	1,910
<p>Note: Grand Prairie and Johnson County SUD will share the cost of developing this connection. The total cost is shown here.</p> <p>Source: Table 5-14 from Region C Four County Study.</p> <p>Costs provided above are reported in second quarter 2007 dollars.</p>			



**Table E-7.**  
**Summary of Current Contracts and Projected Demands Attributed to  
BRA in Johnson County**

<b>Brazos River Authority</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
<b>Demands (Based on meeting needs when they occur)</b>			
<b>Existing Customer Demand (acft/yr)</b>			
Acton MUD	1,126	1,618	2,073
Aquilla WSD & Customers			
Brandon-Irene WSC	188	191	195
Files Valley WSC and Customers	609	618	639
Cleburne	14,490	13,980	13,470
Johnson County SUD	6,612	5,809	9,263
Keene	524	609	702
<b>TOTAL EXISTING CUSTOMERS</b>	<b>23,549</b>	<b>22,825</b>	<b>26,342</b>
<b>Potential Customer Demand (acft/yr)</b>			
Bethany WSC (through Keene)	271	169	77
Parker WSC*	0	0	0
Godley	141	180	224
Grandview	100	151	212
Rio Vista	54	61	69
Johnson County-Other	2236	2210	2326
<b>TOTAL POTENTIAL CUSTOMERS</b>	<b>2,802</b>	<b>2,771</b>	<b>2,908</b>
<b>TOTAL NON-SWATS DEMAND</b>	<b>15,287</b>	<b>14,789</b>	<b>14,304</b>
<b>SWATS Demands (for Existing Customers)</b>	<b>8,262</b>	<b>8,036</b>	<b>12,038</b>
<b>SWATS Demands (for Existing and Proposed Customers)</b>	<b>11,064</b>	<b>10,807</b>	<b>14,946</b>
<b>TOTAL DEMAND</b>	<b>26,351</b>	<b>25,596</b>	<b>29,250</b>
<b>Demands (Generally based on maximum need from 2010-2030 for potential customers and contracts for existing customers)</b>			
	<b>2010</b>	<b>2020</b>	<b>2030</b>
<b>Existing Customer Demand (acft/yr)</b>			
Acton MUD	3,098	4,585	4,585
Aquilla WSD & Customers			
Brandon-Irene WSC	293	270	248
Files Valley WSC and Customers	1,063	985	907
Cleburne	19,673	19,084	18,495
Johnson County SUD	6,612	9,786	9,786
Keene	757	1,121	1,121
<b>TOTAL EXISTING CUSTOMERS DEMAND</b>	<b>31,496</b>	<b>35,831</b>	<b>35,142</b>

**Table E-7.**  
**Summary of Current Contracts and Projected Demands Attributed to**  
**BRA in Johnson County (Continued)**

<b>Brazos River Authority</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
<b>Potential Customer Demand (acft/yr)</b>			
Bethany WSC (through Keene)	271	271	271
Parker WSC	181	181	181
Godley	224	224	224
Grandview	212	212	212
Rio Vista	69	69	69
Johnson County-Other	2,326	2,326	2,326
<b>TOTAL POTENTIAL CUSTOMER DEMAND</b>	<b>3,283</b>	<b>3,283</b>	<b>3,283</b>
<b>TOTAL NON-SWATS DEMAND</b>	<b>21,029</b>	<b>20,339</b>	<b>19,650</b>
<b>SWATS Demands (for Existing Customers)</b>	<b>10,467</b>	<b>15,492</b>	<b>15,492</b>
<b>SWATS Demands (for Existing and Proposed Customers)</b>	<b>13,750</b>	<b>18,775</b>	<b>18,775</b>
<b>TOTAL DEMAND</b>	<b>34,779</b>	<b>39,114</b>	<b>38,425</b>
<b>Demands (Generally based on Contracts prorated to Existing Average Treated Capacity of 10.5 MGD for Year 2010 and based on Design Capacity Contracts of 15.54 MGD beginning in Year 2020.</b>			
	<b>2010</b>	<b>2020</b>	<b>2030</b>
<b>Currently Contracted Raw Water Supplies (acft/yr)</b>			
Lake Aquilla (Cleburne)	5,300	5,300	5,300
Lake Aquilla (Aquilla WSD)	5,953	5,953	5,953
Lake Whitney (Cleburne)	9,700	9,700	9,700
Lake Granbury (Johnson County SUD)	13,210	13,210	13,210
Lake Granbury (Acton MUD)	7,000	7,000	7,000
Lake Granbury (Keene)	2,040	2,040	2,040
<b>TOTAL NON-SWATS SUPPLIES</b>	<b>20,953</b>	<b>20,953</b>	<b>20,953</b>
<b>TOTAL SWATS SUPPLIES</b>	<b>22,250</b>	<b>22,250</b>	<b>22,250</b>
<b>TOTAL SUPPLIES</b>	<b>43,203</b>	<b>43,203</b>	<b>43,203</b>
	<b>Current Production (acft/yr)</b>		<b>Design Capacity (BRA planning to meet this goal)</b>
	<b>Average</b>	<b>Maximum</b>	
<b>BRA SWATS Treated Water Capacity (Johnson County Only)</b>	10,468	12,960	15,492
<b>SWATS Treated Water Contracts</b>			
Acton MUD	3,098	3,835	4,585
JCSUD	6,612	8,187	9,786

**Table E-7.**  
**Summary of Current Contracts and Projected Demands Attributed to**  
**BRA in Johnson County (Concluded)**

<b>Brazos River Authority</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
Keene	757	938	1,121
<b>Total</b>	<b>10,468</b>	<b>12,960</b>	<b>15,492</b>
* Current Production average based on 10.5 MGD capacity, and maximum based on 13 MGD capacity.			
Design capacity is 15.54 MGD.			
<b>Brazos River Authority</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
<b>SURPLUS OR SHORTAGE (Based on Meeting Needs When They Occur)(acft/yr)</b>			
<b>SURPLUS OR SHORTAGE (-) For BRA Non-SWATS Contracts</b>	5,666	6,164	6,649
<b>SURPLUS OR SHORTAGE (-) For BRA SWATS Current and Potential Customers</b>			
SURPLUS OR SHORTAGE (-) With Avg Current Production	-596	-339	-4,478
SURPLUS OR SHORTAGE (-) With Max Current Production	1,896	2,153	-1,986
SURPLUS OR SHORTAGE (-) With Design Capacity Production	4,428	4,685	546
<b>SURPLUS OR SHORTAGE (Based on Maximum Needs from 2010 to 2030 and Contracts) (acft/yr)</b>			
<b>SURPLUS OR SHORTAGE (-) For BRA Non-SWATS Contracts</b>	-76	614	1,303
<b>SURPLUS OR SHORTAGE (-) For BRA SWATS Current and Potential Customers</b>			
SURPLUS OR SHORTAGE (-) With Avg Current Production	-3,282	-8,307	-8,307
SURPLUS OR SHORTAGE (-) With Max Current Production	-790	-5,815	-5,815
SURPLUS OR SHORTAGE (-) With Design Capacity Production	1,742	-3,283	-3,283
* Parker WSC have sufficient supplies from other sources to meet demands			

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***Attachment F***  
***Comments from the Texas Water Development Board***  
***Regarding Phase I Reports and Responses from the***  
***Brazos G Regional Water Planning Group***





# TEXAS WATER DEVELOPMENT BOARD



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February 20, 2009

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GENERAL MANAGER

*A copy to my Bangalore*

Mr. Phillip J. Ford  
General Manager/CEO  
Brazos River Authority  
P.O. Box 7555  
Waco, Texas 76714-7555

Re: Region G, Region-Specific Studies Contract for Regional Water Planning between the Texas Water Development Board (TWDB) and the Brazos River Authority (BRA), TWDB Contract No. 0704830692, Draft Final Study Report Comments.

Dear Mr. Ford:

Staff members of TWDB have completed a review of the Draft Final Study Report under TWDB Contract No. 0704830692. As stated in the above-referenced contract, BRA will consider incorporating Draft Final Study Report comments, shown in Attachment 1, as well as other comments received, into the Final Study Report. In accordance with paragraph F, Article III, Section II of the contract, a copy of these TWDB Executive Administrator comments as well as a written summary of how the Draft Final Study Report was revised in response must be included in all the Final Study Report documents, for example, as an appendix.

TWDB looks forward to receiving one (1) electronic copy of all files, one electronic copy of each Final Study Report in Portable Document Format (PDF), and nine (9) bound double-sided copies of each Final Study Report to the TWDB Executive Administrator no later than the contract Final Study Report Deadline (April 30, 2009 for most reports). Please also transfer copies of all data and reports generated by the planning process and used in developing the Final Study Report to the TWDB Executive Administrator no later than the contract Final Study Report Deadline.

As a reminder, if any portion of the Final Study Report is to be included in a 2011 regional water plan it will be reviewed as part of the Initially Prepared Plan for meeting all statutory and agency rule requirements regarding the preparation of regional water plans.

If you have any questions concerning this contract, please contact Matt Nelson, TWDB's designated Contract Manager for this study at (512) 936-0829.

Sincerely,

*for Dan Hardin*  
Carolyn L. Brittin  
Deputy Executive Administrator  
Water Resources Planning and Information

Enclosures  
Attachment 1

c: Matt Nelson, TWDB

### Our Mission

*To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas.*

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## ATTACHMENT 1

TWDB Contract No. 0704830692

### Region G, Region-Specific Studies 1-5:

#### **TWDB Comments on Draft Final Region-Specific Study Reports:**

- 1) Updated Drought of Record and Water Quality Implications for Reservoirs Upstream of Possum Kingdom Reservoir**
- 2) Groundwater Availability Model of the Edwards-Trinity (Plateau) and Dockum Aquifer in Western Nolan and Eastern Mitchell Counties, Texas**
- 3) Regionalization Strategies to Assist Small Water Systems in Meeting New SDWA Requirements**
- 4) Brazos G Activities in Support of Region C's Water Supply Study for Ellis, Johnson, Southern Dallas, and Southern Tarrant Counties**
- 5) Updated Water Management Strategies for Water User Groups in McLennan County**

#### **Region-Specific Study 1: Updated Drought of Record and Water Quality Implications for Reservoirs Upstream of Possum Kingdom Reservoir**

---

1. Report does not present newly developed model input datasets developed under Task 1, for example, the raw numerical naturalized flow dataset (including from 1998) through June 2008 as used in the model. Please present these data as appendices in report.
2. Page 8, Table 2.1: Please clarify where the rating curves came from for elevation-content calculations.

#### **Region-Specific Study 2: Groundwater Availability Model of the Edwards-Trinity (Plateau) and Dockum Aquifer in Western Nolan and Eastern Mitchell Counties, Texas**

---

1. The data discussed on page 12 does not appear to match the data referred to in Appendix A. In the second to last paragraph, the report refers to the data showing 4,300 acre-feet of municipal pumpage in year 2005. The data in Appendix A do not appear to support this total. Please correct or clarify the basis of the 4,300 reference in the report.
2. Page 12, last paragraph discusses data in Appendix A and states that the total pumping in 2003 was 4,600 acre-feet. The value for 2003 in the Appendix A table however, appears to be 3,823 acre-feet. This paragraph also states the average is 3,240 acft/year, although the data as presented in the Appendix averages 2,851 acre-feet/year. Please correct



reference or clarify how numbers referred to in text were derived. Also, it appears that the totals for years 2001-2004 and 2007 are off by 1 acre-foot.

3. According to Task 1, subtask C in the contract Scope of Work, the report was to "estimate long-term supplies available from the well field." The report does not appear to directly provide estimates of long-term supplies. Please provide information regarding estimated long-term supplies in the report.

### **Region-Specific Study 3: Regionalization Strategies to Assist Small Water Systems in Meeting New SDWA Requirements**

---

1. Page 58, paragraph 3 states that "the TWDB Regional Water Supply and Wastewater Facilities Planning Program could be used to provide up to 50 % of the cost of a detailed analysis of regionalization opportunities to encourage small water systems to actively consider and begin implementation of a regionalization strategy". Please clarify in the report that "TWDB can pay up to 50% of the study costs (75% in areas which have unemployment rates exceeding the state average by 50% or more and per-capita income is 65% or less than the state average for the last reporting period available)..."

### **Region-Specific Study 4: Brazos G Activities in Support of Region C's Water Supply Study for Ellis, Johnson, Southern Dallas, and Southern Tarrant Counties**

---

*TWDB's acceptance of the final report does not constitute approval of any revised population or water demand projections contained therein. The formal procedure for requesting revised projections is stated in TAC 357.5 (d) (2):*

*"Before requesting a revision to the population and water demand projections, the regional water planning group shall discuss the issue at a public meeting for which notice has been posted pursuant to the Open Meetings Act in addition to being published on the internet and mailed at least 14 days before the meeting to every person or entity that has requested notice of regional water planning group activities. The public will be able to submit oral or written comment at the meeting and written comments for 14 days following the meeting. The regional water planning group will summarize the public comments received in its request for projection revisions. Within 45 days of receipt of a request from a regional water planning group for revision of population or water demand projections, the executive administrator shall consult with the requesting regional water planning group and respond to their request."*

*All requested revisions which receive a consensus recommendation from TWDB, the Texas Department of Agriculture, Texas Commission on Environmental Quality, and Texas Parks and Wildlife Department, will then be presented for consideration of Board approval at the next scheduled meeting.*

1. Task 1 of the contract Scope of Work refers to reviewing recent studies. Please provide a general summary of findings regarding recent supply studies and activities in the area since the 2006 Brazos G Regional Water Plan was adopted.
2. Tasks 1 and 4 of the contract Scope of Work refer to reviews of studies and reviews of population projection estimates. While Section 1.0 of the report summarizes the associated activities performed by date, it does not provide a general summary of the findings of these reviews or copies of or summaries of the comments that were provided by Region G consultant as a result of these reviews. Please provide a summary of findings or copies of written comments resulting from this work, for example, as an appendix in the report.
3. The report does not include or make specific reference to the raw population/water demand projections that were provided from individual water providers in the regional study area (e.g. Alvarado, Burleson, JCSUD, Mansfield, and Venus). Please provide copies of these water planning projections that are generally greater than TWDB population and/or water demand projections. If this raw data was included in another available report, please provide a reference.
4. Please consider adding clarifying language to the Executive Summary that more clearly sets forth the purpose and content of this specific report and that explains the need for a reader to also review the "Region C Water Supply Study for Johnson, Southern Dallas, and Southern Tarrant Counties". Consider including a copy of the associated Region C study Table of Contents for reference, for example, in an appendix.
5. Page B-3: Table B-2 is missing from report. Please include in final report.

#### **Region-Specific Study 5: Updated Water Management Strategies for Water User Groups in McLennan County**

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1. Task 3 of the contract scope of work states that the following sections will be included in the draft and final report: "... purpose of study including how the study supports regional water planning, methodology, results, and recommendations, if applicable." These sections are not present in the draft report. Please include them in the final report.

To: Brazos G Regional Water Planning Group	
From: David Dunn, PE	Project: Brazos G 2011 Regional Water Plan
CC: Trey Buzbee, Brazos River Authority	
Date: April 7, 2009	Job No: 00044257-001

**RE:** Suggested responses to TWDB comments regarding the five Phase I Reports

On December 29, 2008, HDR submitted to the Texas Water Development Board (TWDB) draft copies of the reports summarizing the five Phase I studies completed pursuant to the 2011 Brazos G Regional Water Plan. On February 20, 2009, the TWDB provided review comments on each draft report. Those review comments are repeated in this memorandum, followed by HDR's suggested response to each comment.

HDR recommends that the Brazos G RWPG accept these suggested responses to the TWDB comments, and direct HDR and the Brazos River Authority to incorporate the responses into the final versions of the reports, and submit the final reports to the TWDB prior to the report submission deadline of April 30, 2009. A copy of the TWDB review comments and the planning group's responses will be included as an appendix to each report.

### **Region-Specific Study 1: Updated Drought of Record and Water Quality Implications for Reservoirs Upstream of Possum Kingdom Reservoir**

1. Report does not present newly developed model input datasets developed under Task 1, for example, the raw numerical naturalized flow dataset (including from 1998) through June 2008 as used in the model. Please present these data as appendices in report.

*Suggested Response: The newly developed data sets have been printed and included as an appendix to the report.*

2. Page 8, Table 2.1: Please clarify where the rating curves came from for elevation-content calculations.

*Suggested Response: The reservoir elevation-area-capacity relations were obtained from the most recent bathymetric survey available for each reservoir. The last paragraph on page 7 has been updated to make the source of the data more clear.*

### **Region-Specific Study 2: Groundwater Availability Model of the Edwards-Trinity (Plateau) and Dockum Aquifer in Western Nolan and Eastern Mitchell Counties, Texas**

1. The data discussed on page 12 does not appear to match the data referred to in Appendix A. In the second to last paragraph, the report refers to the data showing 4,300 acre-feet of

municipal pumpage in year 2005. The data in Appendix A do not appear to support this total. Please correct or clarify the basis of the 4,300 reference in the report.

*Suggested Response: The data shown in Table A-3 of Appendix A have been corrected.*

2. Page 12, last paragraph discusses data in Appendix A and states that the total pumping in 2003 was 4,600 acre-feet. The value for 2003 in the Appendix A table however, appears to be 3,823 acre-feet. This paragraph also states the average is 3,240 acft/year, although the data as presented in the Appendix averages 2,851 acre-feet/year. Please correct reference or clarify how numbers referred to in text were derived. Also, it appears that the totals for years 2001-2004 and 2007 are off by 1 acre-foot.

*Suggested Response: The numbers in the text have been corrected.*

3. According to Task 1, subtask C in the contract Scope of Work, the report was to “estimate long-term supplies available from the well field.” The report does not appear to directly provide estimates of long-term supplies. Please provide information regarding estimated long-term supplies in the report.

*Suggested Response: The following text has been added to the report as a final paragraph in Section 7 Water Management Strategy for Sweetwater:*

*“If a groundwater only strategy is considered, the performance of the current Champion Well Field from 2001-2007 and the groundwater modeling suggests that the Edwards-Trinity and Dockum Aquifers could meet this average demand, which was about 2,850 acft/yr. If the well field was substantially expanded to the south-southwest, the modeling analysis suggests that it could meet the projected demand of 3,900 acft/yr for the planning period.”*

*And the following text has been added to Section 9 Conclusions:*

*“If a groundwater only strategy is considered, the analysis suggests that the aquifers could meet 2001-2007 average demand of about 2,850 acft/yr. If the well field was substantially expanded to the south-southwest, the analysis suggests that the projected demand of 3,900 acft/yr for the planning period could be met.”*

### **Region-Specific Study 3: Regionalization Strategies to Assist Small Water Systems in Meeting New SDWA Requirements**

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1. Page 58, paragraph 3 states that "the TWDB Regional Water Supply and Wastewater Facilities Planning Program could be used to provide up to 50 % of the cost of a detailed analysis of regionalization opportunities to encourage small water systems to actively consider and begin implementation of a regionalization strategy". Please clarify in the report that "TWDB can pay up to 50% of the study costs (75% in areas which have unemployment rates exceeding the state average by 50% or more and per-capita income is 65% or less than the state average for the last reporting period available)..."

*Suggested Response: The following text has been added as the second sentence of paragraph 3 on page 58:*

*“In some instances, the TWDB can pay for more than 50% of the study costs (75% in areas which have unemployment rates exceeding the state average by 50% or more and per-capita income is 65% or less than the state average for the last reporting period available).”*

#### **Region-Specific Study 4: Brazos G Activities in Support of Region C’s Water Supply Study for Ellis, Johnson, Southern Dallas, and Southern Tarrant Counties**

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1. Task 1 of the contract Scope of Work refers to reviewing recent studies. Please provide a general summary of findings regarding recent supply studies and activities in the area since the 2006 Brazos G Regional Water Plan was adopted.

*Suggested Response: The following text will be added to Section 1.0:*

*“A review was conducted of recent water supply studies in the four-county area, with a primary emphasis on Johnson County entities. The overall message from the studies indicates that population and water demand projections are increasing at a faster pace than the Texas Water Development Board (TWDB) projections from the 2006 Plan. The City of Cleburne conducted a study<sup>1</sup> in May 2007 that showed that new industrial development and oil and gas exploration in the area have increased rapidly, which has led to increased water requirements. A study conducted by Johnson County Special Utility District (JCSUD)<sup>2</sup> showed substantially higher projected population and water demands in Year 2030 than TWDB estimates. The JCSUD study was used as a basis for recommending population and water demand updates, which show a 37% increase in projected population in Year 2030 and nearly 40% increase in projected Year 2030 water demands as compared to TWDB projections used in the 2006 Brazos G Plan. Since the 2006 Brazos G Plan, Johnson County Fresh Water Supply District No. 1 has merged with JCSUD and is shown accordingly in the Four County Study report. Additional studies in the area were reviewed and considered including: information from the City of Arlington regarding their wholesale water rate study, and a report developed jointly by the Brazos River Authority and Tarrant Regional Water District in April 2004 entitled “Regional Water Supply and Wastewater Service Study for Johnson and Parker County.”*

2. Tasks 1 and 4 of the contract Scope of Work refer to reviews of studies and reviews of population projection estimates. While Section 1.0 of the report summarizes the associated activities performed by date, it does not provide a general summary of the findings of these reviews or copies of or summaries of the comments that were provided by Region G consultant as a result of these reviews. Please provide a summary of findings or copies of written comments resulting from this work, for example, as an appendix in the report.

---

<sup>1</sup> *City of Cleburne and Freese and Nichols, “Cleburne Long-Range Water Supply Study- Draft,” May 2007.*

<sup>2</sup> *Johnson County Special Utility District and HDR Engineering, Inc, “Evaluation of Additional Water Supplies from the Trinity and Brazos River Basins,” December 2006.*

*Suggested Response: Copies of selected email correspondence with comments provided by Brazos G consultants have been added as Attachment B-1. An interim progress report update with proposed population and water demand projections was provided to the Brazos G RWPG on October 28, 2008 (as described in Section 1.0). A copy of this presentation has been added as Attachment B-2.*

*In addition, the following text will be added to Section 1:0:*

*“The population and water demand recommendations were reviewed for consistency with information provided by each of the Johnson County entities. In some cases, historical population and water use information was provided which was used to assess the reasonableness of extrapolating historical trends to future population and water demands projections. Due to the large number of entities over the study area, there were numerous review processes required to ensure that the recommended population and water demand projections used in the study were consistent with current trends that Johnson County entities are experiencing and their local plans. A copy of selected email correspondence from Brazos G consultants with comments and results of their reviews of Region C’s interim analyses and reported results is presented in Attachment B-1.”*

3. The report does not include or make specific reference to the raw population/water demand projections that were provided from individual water providers in the regional study area (e.g. Alvarado, Burleson, JCSUD, Mansfield, and Venus). Please provide copies of these water planning projections that are generally greater than TWDB population and/or water demand projections. If this raw data was included in another available report, please provide a reference.

*Suggested Response: The raw population and water demand projections provided by Johnson County water entities will be provided as Attachment A. Text will be added to Section 1.0 to reference Attachment A. For more information regarding how raw population and water demand projections were used to develop recommended projections, please consult Region C’s report entitled “Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County.”*

4. Please consider adding clarifying language to the Executive Summary that more clearly sets forth the purpose and content of this specific report and that explains the need for a reader to also review the “Region C Water Supply Study for Johnson, Southern Dallas, and Southern Tarrant Counties”. Consider including a copy of the associated Region C study Table of Contents for reference, for example, in an appendix.

*Suggested Response: The purpose and content of the specific report was included in the draft report in the executive summary as follows:*

*“The purpose of this study is to review recent growth in the study area, make adjustments to population and demand projections to account for the growth, and update the current and future water plans of the water user groups and wholesale water providers in the study area. This study included conducting meetings and compiling survey data provided by water suppliers regarding their current and future water plans, determining revisions to population and demand projections, and developing a water supply plan for the study area. This report describes the*

*assistance provided by Brazos G to the study effort, and summarizes the information resulting from the study that is pertinent to the Brazos G Area.”*

*The following additional text will be added to the Executive Summary:*

*“Those reading this summary should also consult the ‘Region C Water Supply Study for Ellis County, Johnson County, Southern Dallas County, and Southern Tarrant County,’ which provides the full report and results of the Four County study.”*

5. Page B-3: Table B-2 is missing from report. Please include in final report.

*Suggested Response: Table B-2 (which has been relabeled as Table D-2 in response to renumbering attachments) will be included in the final report.*

## **Region-Specific Study 5: Updated Water Management Strategies for Water User Groups in McLennan County**

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1. Task 3 of the contract scope of work states that the following sections will be included in the draft and final report: “... purpose of study including how the study supports regional water planning, methodology, results, and recommendations, if applicable.” These sections are not present in the draft report. Please include them in the final report.

*Suggested Response: The organization of the report has been restructured as follows:*

*Section 1.0 Introduction has been subdivided into Section 1.1 Purpose of Study and Section 1.2 Methodology. The text states how the study supports regional water planning. Sections 2.0 through 5.0 have been made subdivisions 2.1 through 2.4 of a new Section 2.0 Results, while retaining their original text and organization. Section 5.0 Summary has been titled Section 3.0 Summary and Recommendations with two new subdivisions 3.1 Summary and 3.2 Recommendations, while retaining its original text.*

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