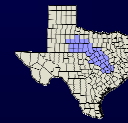


Agenda Item 6.5

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

October 29, 2008

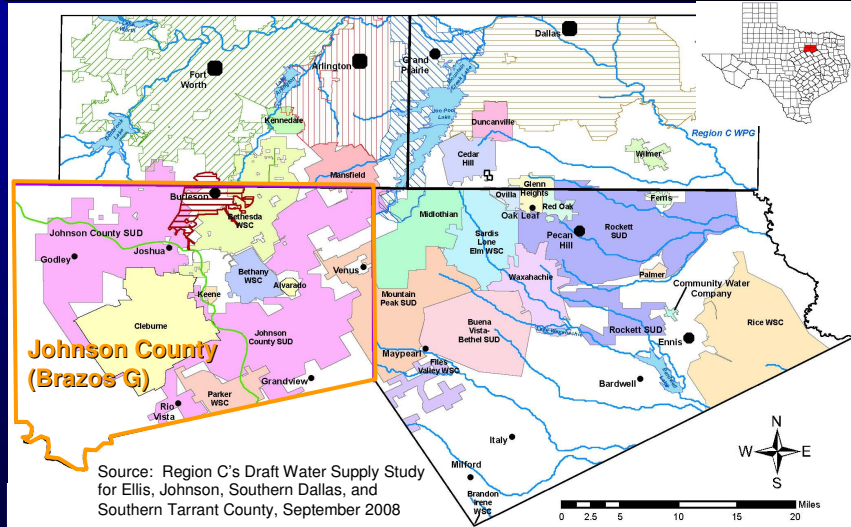


Background on Study

- ✓ 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



BRAZOS G
WATER PLANNING GROUP

3

HDR

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)

BRAZOS G
WATER PLANNING GROUP

4

HDR

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.



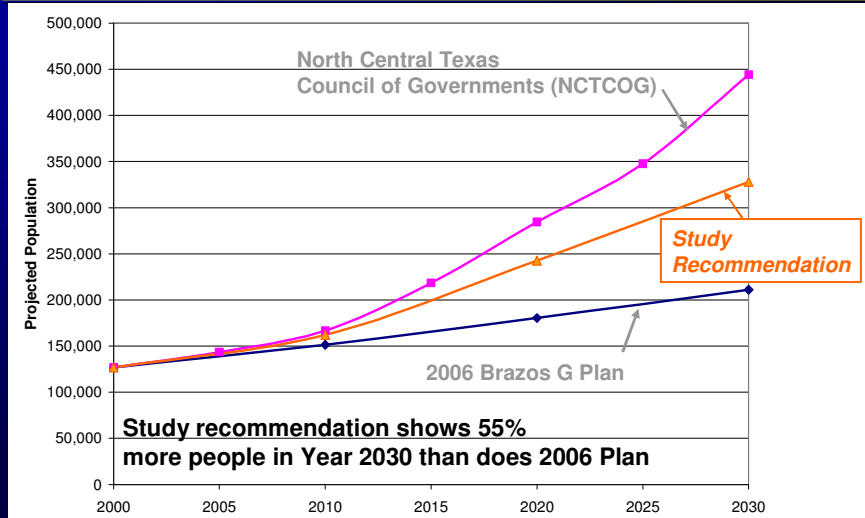
Population Projections for Johnson County Water User Groups

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



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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%



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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
Johnson County- Municipal									
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%
Johnson County Municipal Total	26,359	31,014	36,048	29,577	44,379	60,516	12%	43%	68%

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
Johnson County- Municipal Water Demands	26,359	31,014	36,048	29,577	44,379	60,516	12%	43%	68%
Johnson County- Non Municipal Water Demands									
Johnson County- Manufacturing ^c	372	374	376	374	376	378	1%	1%	1%
Johnson County- Manufacturing (Cleburne) ^c	1,749	2,143	2,527	2,758	4,883	6,148	58%	128%	143%
Johnson County- Mining ^d	370	390	403	4,371	878	1,217	1081%	125%	202%
Johnson County- Mining (Cleburne) ^d	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) ^e	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%
Johnson County Total (Municipal and Non-Municipal)	32,407	37,478	42,911	43,405	56,505	74,248	34%	51%	73%

^c Brazos G 2006 Plan Johnson County manufacturing demand split between Johnson County and Cleburne.

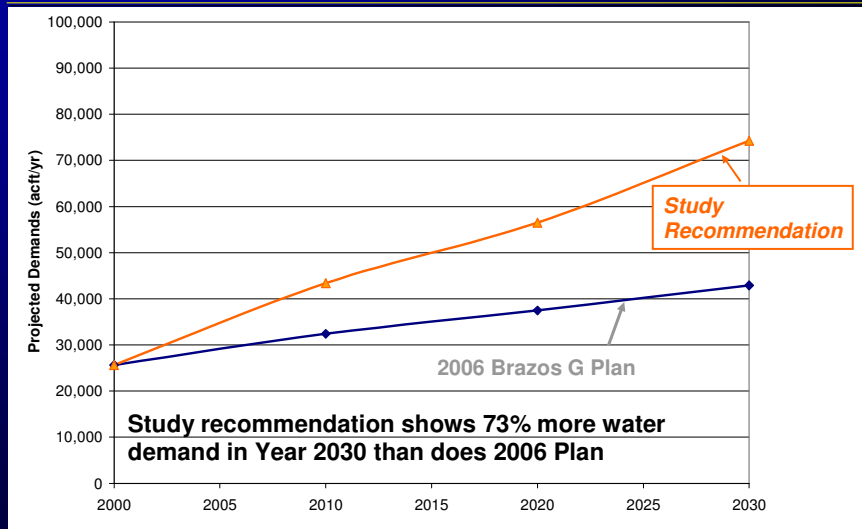
^d Johnson County- Mining increased to account for mining demands as a result of development of Barnett Shale.

^e Brazos G 2006 Plan Johnson County- steam electric demand classified as being supplied by Cleburne.

All units are in acre-feet per year.



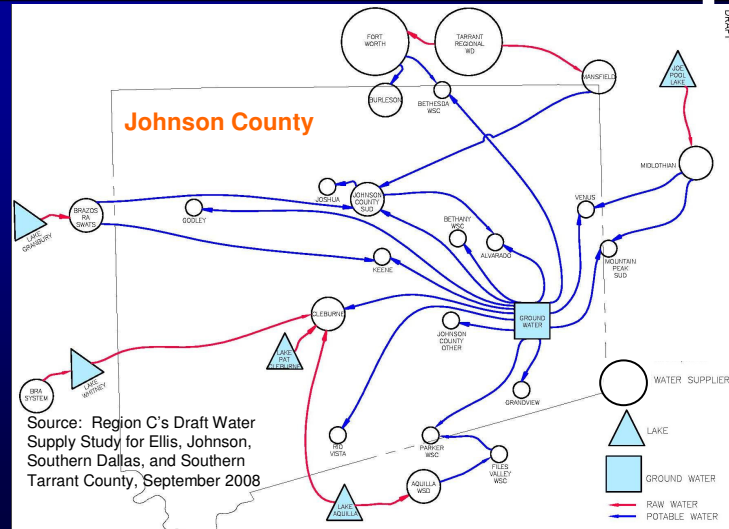
Johnson County Demand Projections



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

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

Brazos River Authority Projected Demand (Needs Met)

Brazos River Authority	2010	2020	2030
Demands (BASED ON MEETING NEEDS WHEN THEY OCCUR)			
Existing Customer Demand (Acre-Feet)			
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
TOTAL EXISTING CUSTOMERS	23,549	22,825	26,345
Potential Customer Demand (Acre-Feet)			
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
TOTAL POTENTIAL CUSTOMERS	2,802	2,771	2,908
TOTAL NON-SWATS DEMAND	15,287	14,789	14,297
<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>
TOTAL DEMAND	26,351	25,596	29,253

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

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

Brazos River Authority	2010	2020	2030
Demands (GENERALLY BASED ON MAXIMUM NEED FROM 2010 - 2030 FOR POTENTIAL CUSTOMERS AND CONTRACTS FOR EXISTING CUSTOMERS)			
Existing Customer Demand (Acre-Feet)			
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
TOTAL EXISTING CUSTOMERS DEMAND	31,496	35,831	35,142
Potential Customer Demand (Acre-Feet)			
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
TOTAL POTENTIAL CUSTOMER DEMAND	3,283	3,283	3,283
TOTAL NON-SWATS DEMAND	21,029	20,339	19,650
SWATS Demands (for Existing Customers)	10,467	15,492	15,492
SWATS Demands (for Existing and Proposed Customers)	13,750	18,775	18,775
TOTAL DEMAND	34,779	39,114	38,425



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Brazos River Authority Water Supplies

Brazos River Authority	2010	2020	2030
Currently Contracted Raw Water Supplies (Acre-Feet)			
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
TOTAL NON-SWATS SUPPLIES	20,953	20,953	20,953
TOTAL SWATS SUPPLIES	22,250	22,250	22,250
TOTAL SUPPLIES	43,203	43,203	43,203

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



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

Brazos River Authority	2010	2020	2030
SURPLUS OR SHORTAGE (Based on Meeting Needs When They Occur)(Acre-Feet)			
SURPLUS OR SHORTAGE (-) For BRA Non-SWATS Contracts	5,666	6,164	6,656
SURPLUS OR SHORTAGE (-) For BRA SWATS Current and Potential Customers			
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
SURPLUS OR SHORTAGE (Based on Maximum Needs from 2010 to 2030 and Contracts) (Acre-Feet)			
SURPLUS OR SHORTAGE (-) For BRA Non-SWATS Contracts	-76	614	1,303
SURPLUS OR SHORTAGE (-) For BRA SWATS Current and Potential Customers			
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



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City of Cleburne Projected Demand and Supplies (Draft)

City of Cleburne	2010	2020	2030
Existing Customer Demand (Acre-Feet)			
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
TOTAL DEMAND	12,970	16,317	19,533
Currently Contracted Supplies (Acre-Feet)			
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
TOTAL CURRENT SUPPLIES	22,366	22,063	21,413
Recommended Supply Strategies (Ac-Ft)			
Reuse	2,375	3,058	4,682
BRA System	0	1,020	1,530
TOTAL SUPPLY (with WMS)	24,741	26,141	27,625
SURPLUS WITH RECOMMENDED STRATEGIES	11,771	9,824	8,092



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
Existing Customer Demand (Acre-Feet)			
Ellis County	27	52	83
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
TOTAL EXISTING CUSTOMERS	8,107	14,317	21,639
Potential Customer Demand (Acre-Feet)			
Bethany WSC	112	224	336
Grand Prairie	3,363	0	0
Potential Loss of Ellis County Connections	-27	-52	-83
Potential Loss of Connections to Ft Worth	0	-100	-102
Potential Loss of Connections to Burleson	0	-100	-103
TOTAL DEMAND	11,555	14,288	21,689
Currently Contracted Supplies (Acre-Feet)			
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
TOTAL CURRENT SUPPLIES	7,776	11,541	12,123
Recommended Supply Strategies (Ac-Ft)			
Temporary Overdraft Trinity Aquifer	723	0	0
Mansfield (TRWD)	3,056	3,363	6,726
Grand Prairie (groundwater)	0	3,363	3,363
TOTAL SUPPLY (with WMS)	11,555	18,266	22,212
SURPLUS WITH RECOMMENDED STRATEGIES	0	3,977	523



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 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	\$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

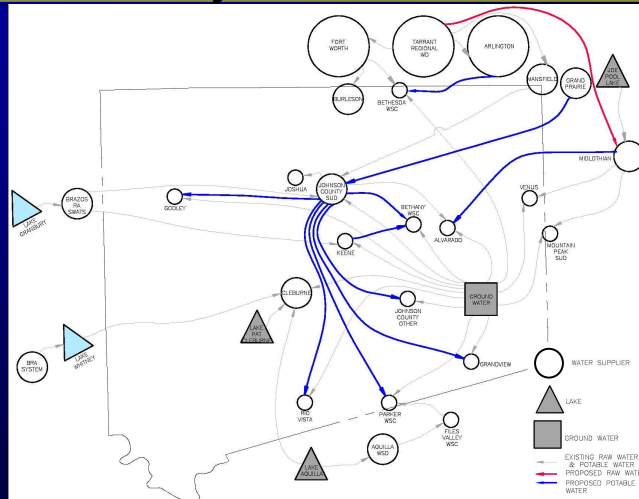
* Note: Grand Prairie and Johnson County SUD will share cost of developing this connection. This is total cost.



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, WWP's, Brazos G planning group (Nov 10, 2008)																	◆
Meet with Johnson County WUGs and WWP's (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?

