

# GAM run 04-05

By **Richard M. Smith**

Texas Water Development Board  
Groundwater Availability Modeling Section  
(512) 936-0877  
May 10, 2004

## **REQUESTOR:**

Mr. H. P. “Bo” Brown, Jr., Chairman, Llano Estacado Regional Water Planning Group (LERWPG)

## **DESCRIPTION OF REQUEST:**

The LERWPG requested that the Southern Ogallala Groundwater Availability Model (GAM) be run using the water demand projections for water user groups (WUGs) of LERWPG, as approved by the Texas Water Development Board on September 17, 2003 for the period of record through 2060. The requested output, completed on March 19, 2004, was in the form of water-level maps, maps of saturated thickness, and maps showing municipal areas with dry cells highlighted. Additional information was requested showing the volume of groundwater present in each county-basin zone throughout the Region “O” area for each of the projection dates 2004, 2010, 2020, 2030, 2040, 2050 and 2060. Also, the quantity of water pumped from each of the county-basin areas at each of the projection dates was also requested. The attached Excel table was supplied to the Texas Water Development Board by Mr. Herb Grubb of HDR Engineering, Inc. and the Supply Information was completed for each county and totaled at the end of the table.

## **METHODS:**

After the model run, in order to compute the volume of groundwater in each county-basin area, the hydraulic heads for 2004, 2010, 2020, 2030, 2040, 2050, and 2060 were saved as database files to be imported into ArcGIS. The bottom elevations for each cell (a square mile each) were subtracted from the hydraulic heads; multiplied by the specific yield to give a water volume per square foot. This value was multiplied by 5280<sup>2</sup> to give total volume in cubic feet and divided by 43,560 in order to convert the answer to acre-feet per cell. Finally, the cells for each county-basin area were summed to yield the final total volume in acre-feet. The value for 2004 is entered into the “2000” column for the sake of simplicity.

The amount of water pumped from each county-basin area was obtained from the PMWIN water budget files for each of the projected years. Once again, the 2004 value is entered into the “2000” column.

## **PARAMETERS AND ASSUMPTIONS:**

The recharge in the model represented average climatic conditions for the entire model run of 2001 to 2060. No change in pumpage was considered for the counties not included on the new projected demands table. All other parameters and assumptions agree with those discussed in the GAM final report (Blandford and others, 2003).

## **RESULTS:**

The pumpage for each county-basin area shown in the table for each projected year is less than the Regional Water Planning Group projection for the same area. The reason for this apparent discrepancy is the presence of dry cells within the county-basin area. As cells go dry, which actually means the water level in the cell drops below the bottom of the cell, pumping ceases in that particular cell and as a result, overall pumpage for the county-basin area is reduced.

The “dry cell phenomena” can result in the model indicating water level rises in certain areas. As the water level drops below the bottom of the cell, pumping ceases in the affected cell or cells. Lateral inflow and recharge function to increase water levels within these same cells. No additional pumping takes place in these cells during the projected period and therefore, projected water levels will steadily rise and can exceed initial levels. Furthermore, pumping levels as indicated by the model can be greatly reduced from the Regional Water Planning Group projected pumpage due to the dry cell phenomena. For instance, Bailey County shows a dramatic difference between the RWPG pumpage numbers and the pumpage used in the model. This is due to a plethora of dry cells in the northern section of the county beginning in the “2000” column which is a projected number.

Water level rises are not exclusive to the “dry cell phenomena”. The model indicates rises in water levels through time in the southeastern and eastern counties of the model domain. Measured water levels suggest that the water table is rising in some of these areas. Water level maps showing dry cells and changes in water levels which were generated for GAM Report 03-36 should be consulted to best interpret these results.

Furthermore, it can be seen from the table that volumes and projected pumping rates diminish through time. The saturated thickness of the Ogallala aquifer continues to shrink with the thinnest section occurring in 2060.

## **REFERENCES:**

Blandford, T. N., Blazer, D. J., Calhoun, K. C., Dutton, A. R., Naing, T., Reedy, R. C., and Scanlon, B. R., 2003, Groundwater availability of the southern Ogallala aquifer in Texas and New Mexico: Numerical simulations through 2050: Final Report prepared by D. B. Stephens & Assoc, for the Texas Water Development Board.

County Water Use	WUG Name	Basin Name	2000 ac-ft	2010 ac-ft	2020 ac-ft	2030 ac-ft	2040 ac-ft	2050 ac-ft	2060 ac-ft
<b>BAILEY County</b>									
Municipal	COUNTY-OTHER	BRAZOS	331	342	358	364	371	370	363
Municipal	MULESHOE	BRAZOS	979	1,027	1,082	1,109	1,137	1,135	1,114
Municipal	Total		1,310	1,369	1,440	1,473	1,508	1,505	1,477
Manufacturing		BRAZOS	264	303	316	326	335	343	365
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Irrigation		BRAZOS	182,865	172,139	168,010	163,980	160,046	156,206	152,457
Mining		BRAZOS	0	0	0	0	0	0	0
Livestock		BRAZOS	1,723	2,824	3,856	3,962	4,074	4,192	4,318
	<b>TOTAL</b>		186,162	176,635	173,622	169,741	165,963	162,246	158,617
<b>SUPPLY INFORMATION</b>									
Quantity in Storage (in 2004, enter in 2000 col.)		BRAZOS	3,006,111	2,786,786	2,622,297	2,535,908	2,459,710	2,432,211	2,424,745
Quantity Pumped (annual at each projection date)		BRAZOS	68,998	43,916	27,300	21,582	18,613	17,883	17,067
<b>BRISCOE County</b>									
Municipal	COUNTY-OTHER	RED	180	183	183	176	165	159	155
Municipal	SILVERTON	RED	126	128	128	123	115	111	108
Municipal	Total		306	311	311	299	280	270	263
Manufacturing		RED	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		RED	26,329	29,002	27,950	26,936	25,958	25,016	24,108
Mining		RED	0	0	0	0	0	0	0
Livestock		RED	317	325	334	343	353	363	374
	<b>TOTAL</b>		26,952	29,638	28,595	27,578	26,591	25,649	24,745
<b>SUPPLY INFORMATION</b>									
Quantity in Storage (in 2004, enter in 2000 col.)		Red	2,164,466	2,036,351	1,870,525	1,756,762	1,680,434	1,650,541	1,632,676
Quantity Pumped (annual at each projection date)		Red	23,871	22,800	15,867	9,872	7,460	5,388	4,888

**CASTRO County**

Municipal	COUNTY-OTHER	BRAZOS	208	222	234	240	243	241	237
Municipal	COUNTY-OTHER	RED	247	263	278	285	288	286	281
Municipal	DIMMITT	BRAZOS	975	1,041	1,103	1,137	1,159	1,150	1,130
Municipal	HART	BRAZOS	223	238	251	258	262	260	256
Municipal	Total		1,653	1,764	1,866	1,920	1,952	1,937	1,904
Manufacturing		BRAZOS	1,637	1,923	2,082	2,213	2,337	2,445	2,617
Manufacturing		RED	95	112	121	128	136	142	152
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		BRAZOS	337,541	239,669	230,482	221,644	213,147	204,975	197,116
Irrigation		RED	166,251	118,046	113,520	109,168	104,982	100,957	97,087
Mining		BRAZOS	0	0	0	0	0	0	0
Mining		RED	0	0	0	0	0	0	0
Livestock		BRAZOS	2,631	3,599	4,417	4,623	4,842	5,074	5,321
Livestock		RED	3,215	4,398	5,399	5,650	5,918	6,202	6,503
	TOTAL	BRAZOS	343,215	246,692	238,569	230,115	221,990	214,145	206,677
	TOTAL	RED	169,808	122,819	119,318	115,231	111,324	107,587	104,023
	TOTAL		513,023	369,511	357,887	345,346	333,314	321,732	310,700

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	2,817,626	2,222,567	1,460,181	991,079	743,569	678,750	633,894
Quantity Pumped (annual at each projection date)	Red	141,434	110,256	72,609	45,405	25,992	23,784	20,890
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	5,984,144	4,673,280	2,778,583	1,263,919	479,975	375,623	263,380
Quantity Pumped (annual at each projection date)	BRAZOS	292,867	235,507	211,116	147,124	59,674	44,832	38,066

**COCHRAN County**

Municipal	COUNTY-OTHER	BRAZOS	172	183	191	192	185	176	167
Municipal	COUNTY-OTHER	COLORADO	92	98	102	103	99	95	90
Municipal	MORTON	BRAZOS	499	535	560	565	547	521	496
Municipal	Total		763	816	853	860	831	792	753
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		COLORADO	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		COLORADO	0	0	0	0	0	0	0
Irrigation		BRAZOS	76,790	48,009	46,157	44,376	42,662	41,015	39,432
Irrigation		COLORADO	43,195	27,005	25,964	24,962	23,998	23,072	22,181
Mining		BRAZOS	16	14	10	8	6	4	2
Mining		COLORADO	1,704	1,448	1,022	852	639	426	256
Livestock		BRAZOS	544	697	861	900	941	984	1,030
Livestock		COLORADO	103	132	163	170	178	186	195
	TOTAL	BRAZOS	78,021	49,438	47,779	46,041	44,341	42,700	41,127
	TOTAL	COLORADO	45,094	28,683	27,251	26,087	24,914	23,779	22,722
	TOTAL		123,115	78,121	75,030	72,128	69,255	66,479	63,849

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	579,461	528,380	447,471	434,696	401,709	405,687	405,504
Quantity Pumped (annual at each projection date)	BRAZOS	39,014	15,725	10,202	6,951	6,177	6,101	5,990
Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	2,669,705	2,600,529	2,598,456	2,584,256	2,608,981	2,629,756	2,629,589
Quantity Pumped (annual at each projection date)	COLORADO	22,596	12,015	7,427	6,717	6,481	5,929	5,790

<b>CROSBY County</b>									
Municipal	COUNTY-OTHER	BRAZOS	202	210	217	220	222	220	217
Municipal	COUNTY-OTHER	RED	1	1	1	1	1	1	1
Municipal	CROSBYTON	BRAZOS	351	369	386	394	402	400	394
Municipal	LORENZO	BRAZOS	260	275	288	296	302	301	296
Municipal	RALLS	BRAZOS	290	304	315	322	325	323	318
Municipal	Total		1,104	1,159	1,207	1,233	1,252	1,245	1,226
Manufacturing		BRAZOS	5	6	6	6	6	6	6
Manufacturing		RED	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		BRAZOS	109,892	99,305	95,304	91,464	87,778	84,244	80,851
Irrigation		RED	2,243	2,027	1,945	1,867	1,792	1,719	1,650
Mining		BRAZOS	119	71	34	20	8	0	0
Mining		RED	70	41	20	11	5	0	0
Livestock		BRAZOS	293	299	304	311	318	326	333
Livestock		RED	2	2	3	3	3	3	3
	TOTAL	BRAZOS	111,412	100,839	96,854	93,033	89,361	85,820	82,415
	TOTAL	RED	2,316	2,071	1,969	1,882	1,801	1,723	1,654
	TOTAL		113,728	102,910	98,823	94,915	91,162	87,543	84,069

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	88,869	94,099	80,773	76,630	72,995	72,514	72,127
Quantity Pumped (annual at each projection date)	Red	1,391	1,307	1,256	1,204	1,158	1,101	1,078
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	10,860,146	10,518,753	10,004,335	9,903,661	9,079,445	8,965,722	8,874,426
Quantity Pumped (annual at each projection date)	BRAZOS	102,831	96,710	92,844	89,147	85,593	83,138	79,835

<b>DAWSON County</b>									
Municipal	COUNTY-OTHER	BRAZOS	18	18	18	19	18	18	17
Municipal	COUNTY-OTHER	COLORADO	605	610	612	616	607	587	565
Municipal	LAMESA	COLORADO	2,486	2,540	2,573	2,602	2,603	2,529	2,433
Municipal	O'DONNELL	BRAZOS	17	17	17	17	17	17	16
Municipal	Total		3,126	3,185	3,220	3,254	3,245	3,151	3,031
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		COLORADO	101	119	129	137	144	150	162
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		COLORADO	0	0	0	0	0	0	0
Irrigation		BRAZOS	1,460	645	608	574	542	511	482
Irrigation		COLORADO	144,579	63,827	60,230	56,834	53,629	50,607	47,754
Mining		BRAZOS	0	0	0	0	0	0	0
Mining		COLORADO	2,728	1,624	779	455	195	0	0
Livestock		BRAZOS	1	1	1	1	1	1	1
Livestock		COLORADO	151	154	157	161	165	169	173
	TOTAL	BRAZOS	1,496	681	644	611	578	547	516
	TOTAL	COLORADO	150,650	68,874	64,480	60,805	57,343	54,042	51,087
	TOTAL		152,146	69,555	65,124	61,416	57,921	54,589	51,603

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	160,390	169,514	184,651	199,733	214,624	221,560	230,313
Quantity Pumped (annual at each projection date)	BRAZOS	19	19	18	18	17	17	17
Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	7,106,402	7,041,932	7,142,345	7,280,328	7,442,779	7,605,891	7,764,702
Quantity Pumped (annual at each projection date)	COLORADO	94,967	45,194	37,509	34,548	31,267	31,240	31,195

<b>DEAF SMITH County</b>									
Municipal	COUNTY-OTHER	CANADIAN	0	1	1	1	1	1	1
Municipal	COUNTY-OTHER	RED	572	743	932	1,100	1,243	1,286	1,305
Municipal	HEREFORD	RED	3,564	3,634	3,694	3,751	3,788	3,801	3,813
Municipal	Total		4,136	4,378	4,627	4,852	5,032	5,088	5,119
Manufacturing		CANADIAN	0	0	0	0	0	0	0
Manufacturing		RED	1,234	1,454	1,594	1,710	1,821	1,917	2,055
Steam-Electric		CANADIAN	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		CANADIAN	0	0	0	0	0	0	0
Irrigation		RED	372,827	246,983	239,160	231,583	224,246	217,142	210,263
Mining		CANADIAN	0	0	0	0	0	0	0
Mining		RED	0	0	0	0	0	0	0
Livestock		CANADIAN	102	130	152	160	168	176	185
Livestock		RED	10,054	12,796	15,048	15,780	16,557	17,381	18,253
	TOTAL	CANADIAN	102	131	153	161	169	177	186
	TOTAL	RED	388,251	265,610	260,428	253,924	247,655	241,527	235,689
	TOTAL		388,353	265,741	260,581	254,085	247,824	241,704	235,875

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	CANADIAN	2,599	1,798	894	684	684	684	684
Quantity Pumped (annual at each projection date)	CANADIAN	171	112	74	0	0	0	0
Quantity in Storage (in 2004, enter in 2000 col.)	RED	7,849,168	6,645,748	5,230,088	4,162,529	3,383,183	3,152,241	2,999,333
Quantity Pumped (annual at each projection date)	RED	298,069	204,702	170,696	128,079	88,181	86,200	81,705

**DICKENS County**

Municipal	COUNTY-OTHER	BRAZOS	234	224	212	194	169	158	147
Municipal	COUNTY-OTHER	RED	45	43	41	38	33	30	28
Municipal	SPUR	BRAZOS	275	271	267	263	260	257	257
Municipal	Total		554	538	520	495	462	445	432
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		RED	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		BRAZOS	5,407	2,837	2,752	2,670	2,591	2,513	2,437
Irrigation		RED	4,079	2,140	2,076	2,015	1,955	1,896	1,839
Mining		BRAZOS	165	98	47	27	12	0	0
Mining		RED	0	0	0	0	0	0	0
Livestock		BRAZOS	390	399	408	417	427	437	448
Livestock		RED	230	235	240	245	251	258	264
	TOTAL	BRAZOS	6,471	3,829	3,686	3,571	3,459	3,365	3,289
	TOTAL	RED	4,354	2,418	2,357	2,298	2,239	2,184	2,131
	TOTAL		10,825	6,247	6,043	5,869	5,698	5,549	5,420

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	571,097	559,275	544,692	539,989	528,008	519,954	515,918
Quantity Pumped (annual at each projection date)	Red	3,192	2,086	2,021	1,963	1,632	1,592	1,546
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	631,318	620,631	598,658	586,095	574,008	584,310	580,537
Quantity Pumped (annual at each projection date)	BRAZOS	4,278	2,809	2,722	2,640	2,562	2,500	2,430

<b>FLOYD County</b>									
Municipal	COUNTY-OTHER	BRAZOS	178	183	185	183	180	172	163
Municipal	COUNTY-OTHER	RED	103	106	107	106	104	100	95
Municipal	FLOYDADA	BRAZOS	663	680	696	693	685	657	623
Municipal	LOCKNEY	BRAZOS	237	242	244	240	234	224	212
Municipal	Total		1,181	1,211	1,232	1,222	1,203	1,153	1,093
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		RED	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		BRAZOS	130,361	94,979	91,197	87,564	84,076	80,727	77,512
Irrigation		RED	106,659	77,710	74,615	71,643	68,789	66,050	63,419
Mining		BRAZOS	0	0	0	0	0	0	0
Mining		RED	0	0	0	0	0	0	0
Livestock		BRAZOS	1,029	1,236	1,396	1,462	1,532	1,605	1,683
Livestock		RED	342	411	465	487	510	535	561
	TOTAL	BRAZOS	132,468	97,320	93,718	90,142	86,707	83,385	80,193
	TOTAL	RED	107,104	78,227	75,187	72,236	69,403	66,685	64,075
	TOTAL		239,572	175,547	168,905	162,378	156,110	150,070	144,268

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	5,491,376	5,163,180	4,909,263	4,577,147	4,384,446	4,345,782	4,267,211
Quantity Pumped (annual at each projection date)	Red	77,536	52,505	32,434	25,205	21,096	20,270	19,510
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	7,520,632	6,668,927	6,488,195	5,912,120	5,379,850	5,241,354	5,142,280
Quantity Pumped (annual at each projection date)	BRAZOS	105,849	86,288	81,860	78,044	73,821	70,449	68,588

**GAINES County**

Municipal	COUNTY-OTHER	COLORADO	704	754	800	823	839	824	813
Municipal	SEAGRAVES	COLORADO	416	449	482	502	513	506	499
Municipal	SEMINOLE	COLORADO	2,019	2,214	2,401	2,525	2,605	2,579	2,544
Municipal	Total		3,139	3,417	3,683	3,850	3,957	3,909	3,856
Manufacturing		COLORADO	0	0	0	0	0	0	0
Steam-Electric		COLORADO	0	0	0	0	0	0	0
Irrigation		COLORADO	414,772	374,875	355,350	336,844	319,301	302,670	286,906
Mining		COLORADO	6,071	5,746	4,011	2,493	1,084	217	0
Livestock		COLORADO	796	913	995	1,045	1,099	1,156	1,216
	TOTAL		424,778	384,951	364,039	344,232	325,441	307,952	291,978

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	12,605,139	11,181,964	9,521,736	8,371,870	7,529,682	7,416,210	7,302,777
Quantity Pumped (annual at each projection date)	COLORADO	350,393	286,884	187,951	138,115	101,105	87,884	82,249



<b>GARZA County</b>									
Municipal	COUNTY-OTHER	BRAZOS	154	156	156	150	141	132	123
Municipal	COUNTY-OTHER	COLORADO	0	0	0	0	0	0	0
Municipal	POST	BRAZOS	623	631	642	616	579	549	512
Municipal	Total		777	787	798	766	720	681	635
Manufacturing		BRAZOS	2	2	2	2	2	2	2
Manufacturing		COLORADO	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		COLORADO	0	0	0	0	0	0	0
Irrigation		BRAZOS	12,165	5,623	5,295	4,983	4,692	4,418	4,160
Irrigation		COLORADO	0	0	0	0	0	0	0
Mining		BRAZOS	1,264	752	361	211	90	0	0
Mining		COLORADO	0	0	0	0	0	0	0
Livestock		BRAZOS	355	363	423	432	442	453	465
Livestock		COLORADO	0	0	0	0	0	0	0
	TOTAL	BRAZOS	14,563	7,527	6,879	6,394	5,946	5,554	5,262
	TOTAL	COLORADO	0	0	0	0	0	0	0
	TOTAL		14,563	7,527	6,879	6,394	5,946	5,554	5,262

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	1,047,648	1,070,980	1,128,156	1,176,779	1,237,992	1,284,901	1,317,751
Quantity Pumped (annual at each projection date)	BRAZOS	7,353	4,409	3,970	3,736	3,518	3,349	3,308
Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	0	0	0	0	0	0	0
Quantity Pumped (annual at each projection date)	COLORADO	0	0	0	0	0	0	0

**HALE County**

Municipal	ABERNATHY	BRAZOS	461	486	508	526	531	525	514
Municipal	COUNTY-OTHER	BRAZOS	1,109	1,144	1,187	1,207	1,203	1,184	1,161
Municipal	COUNTY-OTHER	RED	0	0	0	0	0	0	0
Municipal	HALE CENTER	BRAZOS	446	470	493	509	513	507	498
Municipal	PETERSBURG	BRAZOS	276	289	304	313	316	312	306
Municipal	PLAINVIEW	BRAZOS	4,078	4,288	4,490	4,605	4,635	4,577	4,488
Municipal	Total		6,370	6,677	6,982	7,160	7,198	7,105	6,967
Manufacturing		BRAZOS	2,605	2,993	3,188	3,339	3,482	3,604	3,840
Manufacturing		RED	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		BRAZOS	364,023	363,164	351,131	339,497	328,249	317,373	306,857
Irrigation		RED	3,677	3,668	3,547	3,429	3,316	3,206	3,100
Mining		BRAZOS	258	88	34	19	0	0	0
Mining		RED	0	0	0	0	0	0	0
Livestock		BRAZOS	1,525	2,148	2,688	2,795	2,910	3,031	3,160
Livestock		RED	15	21	27	28	29	30	31
	TOTAL	BRAZOS	374,781	375,070	364,023	352,810	341,839	331,113	320,824
	TOTAL	RED	3,692	3,689	3,574	3,457	3,345	3,236	3,131
	TOTAL		378,473	378,759	367,597	356,267	345,184	334,349	323,955

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	29,446	18,450	16,419	6,085	5,484	5,410	5,342
Quantity Pumped (annual at each projection date)	Red	3,499	829	0	0	0	0	0
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	9,837,572	8,174,441	5,575,536	3,645,123	2,458,242	2,158,654	1,881,355
Quantity Pumped (annual at each projection date)	BRAZOS	353,652	348,301	302,704	206,807	127,551	98,721	89,136

**HOCKLEY County**

Municipal	ANTON	BRAZOS	250	263	270	272	268	256	243
Municipal	COUNTY-OTHER	BRAZOS	854	881	897	895	872	830	790
Municipal	COUNTY-OTHER	COLORADO	40	41	42	42	41	39	37
Municipal	LEVELLAND	BRAZOS	2,219	2,310	2,362	2,369	2,322	2,216	2,107
Municipal	ROPEVILLE	BRAZOS	85	89	91	91	89	85	81
Municipal	SMYER	BRAZOS	67	69	70	70	68	65	62
Municipal	SUNDOWN	COLORADO	325	341	350	353	347	332	316
Municipal	Total		3,840	3,994	4,082	4,092	4,007	3,823	3,636
Manufacturing		BRAZOS	53	61	65	68	71	73	78
Manufacturing		COLORADO	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		COLORADO	0	0	0	0	0	0	0
Irrigation		BRAZOS	157,496	107,099	102,910	98,887	95,018	91,304	87,734
Irrigation		COLORADO	17,500	11,900	11,435	10,988	10,558	10,145	9,749
Mining		BRAZOS	3,302	2,358	1,510	981	378	19	0
Mining		COLORADO	1,114	796	509	331	127	6	0
Livestock		BRAZOS	560	634	733	766	801	837	876
Livestock		COLORADO	48	55	63	66	69	73	76
	TOTAL	BRAZOS	164,886	113,764	108,908	104,399	99,887	95,685	91,971
	TOTAL	COLORADO	19,027	13,133	12,399	11,780	11,142	10,595	10,178
	TOTAL		183,913	126,897	121,307	116,179	111,029	106,280	102,149

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	4,445,678	4,012,574	3,520,944	3,122,056	2,822,881	281,456	2,768,066
Quantity Pumped (annual at each projection date)	BRAZOS	130,699	96,889	79,415	67,208	55,876	53,945	50,540
Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	1,034,833	980,634	911,792	843,370	792,366	776,547	765,041
Quantity Pumped (annual at each projection date)	COLORADO	16,193	12,761	10,678	8,807	8,186	7,686	7,689

**LAMB County**

Municipal	AMHERST	BRAZOS	163	168	176	182	185	183	181
Municipal	COUNTY-OTHER	BRAZOS	766	794	830	861	880	872	861
Municipal	EARTH	BRAZOS	248	257	268	277	283	280	276
Municipal	LITTLEFIELD	BRAZOS	1,480	1,530	1,602	1,660	1,694	1,676	1,655
Municipal	OLTON	BRAZOS	474	492	512	532	542	536	529
Municipal	SUDAN	BRAZOS	218	226	236	244	249	246	243
Municipal	Total		3,349	3,467	3,624	3,756	3,833	3,793	3,745
Manufacturing		BRAZOS	426	490	519	541	562	580	618
Steam-Electric		BRAZOS	17,990	17,827	17,663	20,651	24,292	28,731	34,142
Irrigation		BRAZOS	377,893	303,774	292,052	280,783	269,949	259,533	249,519
Mining		BRAZOS	88	52	25	15	6	0	0
Livestock		BRAZOS	2,412	3,661	4,817	4,949	5,090	5,239	5,397
	TOTAL		402,158	329,271	318,700	310,695	303,732	297,876	293,421

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	8,246,693	6,944,619	5,155,582	3,861,385	2,953,511	2,743,521	2,533,373
Quantity Pumped (annual at each projection date)	BRAZOS	330,179	267,764	210,668	156,745	109,741	91,026	81,651

<b>LUBBOCK County</b>									
Municipal	ABERNATHY	BRAZOS	153	171	182	188	186	190	186
Municipal	COUNTY-OTHER	BRAZOS	3,417	3,006	3,051	3,053	2,909	2,907	2,744
Municipal	IDALOU	BRAZOS	288	289	288	281	274	273	272
Municipal	LUBBOCK	BRAZOS	40,460	41,765	42,580	42,652	42,033	42,349	41,915
Municipal	NEW DEAL	BRAZOS	126	149	165	173	173	178	173
Municipal	RANSOM CANYON	BRAZOS	310	440	569	698	825	953	1,004
Municipal	SHALLOWATER	BRAZOS	311	344	367	377	371	379	371
Municipal	SLATON	BRAZOS	931	907	889	870	849	837	836
Municipal	WOLFFORTH	BRAZOS	412	1,468	1,758	1,822	1,884	1,962	2,006
Municipal	Total		46,408	48,539	49,849	50,114	49,504	50,028	49,507
Manufacturing		BRAZOS	1,566	1,881	2,103	2,291	2,472	2,625	2,836
Steam-Electric		BRAZOS	5,776	5,221	4,440	5,191	6,106	7,222	8,582
Irrigation		BRAZOS	242,978	174,779	164,967	155,706	146,964	138,715	130,929
Mining		BRAZOS	352	209	101	59	25	0	0
Livestock		BRAZOS	972	1,136	1,248	1,316	1,389	1,466	1,548
	TOTAL		298,052	231,765	222,708	214,677	206,460	200,056	193,402
<b>SUPPLY INFORMATION</b>									
Quantity in Storage (in	2004, enter in 2000 col.)	BRAZOS	7,439,809	6,632,577	5,611,743	4,952,167	4,159,806	4,141,607	4,114,001
Quantity Pumped	(annual at each projection date)	BRAZOS	208,547	163,283	131,367	110,204	88,545	85,490	80,557

<b>LYNN County</b>									
Municipal	COUNTY-OTHER	BRAZOS	290	299	301	292	282	267	249
Municipal	COUNTY-OTHER	COLORADO	6	7	7	6	6	6	6
Municipal	O'DONNELL	BRAZOS	139	144	146	142	138	130	121
Municipal	TAHOKA	BRAZOS	473	492	504	490	478	453	421
Municipal	WILSON	BRAZOS	65	67	68	65	63	60	55
Municipal	Total		973	1,009	1,026	995	967	916	852
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		COLORADO	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		COLORADO	0	0	0	0	0	0	0
Irrigation		BRAZOS	119,289	48,861	46,233	43,746	41,392	39,165	37,059
Irrigation		COLORADO	1,083	444	420	397	376	356	336
Mining		BRAZOS	66	39	19	11	5	0	0
Mining		COLORADO	15	9	4	2	1	0	0
Livestock		BRAZOS	129	132	136	140	144	149	153
Livestock		COLORADO	11	11	11	12	12	12	13
	TOTAL	BRAZOS	120,451	50,034	47,407	44,886	42,502	40,224	38,058
	TOTAL	COLORADO	1,115	471	442	417	395	374	355
	TOTAL		121,566	50,505	47,849	45,303	42,897	40,598	38,413
<b>SUPPLY INFORMATION</b>									
Quantity in Storage (in	2004, enter in 2000 col.)	BRAZOS	5,055,474	4,808,231	5,137,976	5,302,478	5,493,078	5,761,310	6,041,461
Quantity Pumped	(annual at each projection date)	BRAZOS	86,265	45,983	42,909	39,253	34,794	34,664	34,555
Quantity in Storage (in	2004, enter in 2000 col.)	COLORADO	370,105	388,963	413,787	435,222	455,254	460,025	464,792
Quantity Pumped	(annual at each projection date)	COLORADO	818	452	428	404	383	364	346

<b>MOTLEY County</b>									
Municipal	COUNTY-OTHER	RED	148	143	136	123	108	98	93
Municipal	MATADOR	RED	239	234	224	207	187	174	166
Municipal	Total		387	377	360	330	295	272	259
Manufacturing		RED	5	6	6	6	6	6	6
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		RED	9,168	4,689	4,548	4,413	4,281	4,153	4,028
Mining		RED	15	9	4	3	1	0	0
Livestock		RED	625	636	647	659	671	684	698
	TOTAL		10,200	5,717	5,565	5,411	5,254	5,115	4,991

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	1,128,903	1,099,574	1,060,231	1,019,923	992,186	980,485	974,785
Quantity Pumped (annual at each projection date)	Red	7,142	4,581	4,434	2,288	2,215	2,157	2,094

<b>PARMER County</b>									
Municipal	BOVINA	BRAZOS	309	321	334	335	330	317	300
Municipal	COUNTY-OTHER	BRAZOS	287	297	305	304	298	286	270
Municipal	COUNTY-OTHER	RED	106	110	113	112	110	106	100
Municipal	FARWELL	BRAZOS	370	388	405	410	408	393	371
Municipal	FRIONA	RED	803	835	872	879	870	838	791
Municipal	Total		1,875	1,951	2,029	2,040	2,016	1,940	1,832
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		RED	2,070	2,427	2,617	2,772	2,921	3,051	3,261
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		BRAZOS	294,969	243,430	240,846	238,289	235,759	233,256	230,779
Irrigation		RED	120,480	99,429	98,373	97,329	96,296	95,273	94,262
Mining		BRAZOS	0	0	0	0	0	0	0
Mining		RED	0	0	0	0	0	0	0
Livestock		BRAZOS	3,372	4,579	5,581	5,845	6,126	6,425	6,741
Livestock		RED	2,323	3,154	3,844	4,027	4,221	4,426	4,644
	TOTAL	BRAZOS	299,307	249,015	247,471	245,183	242,921	240,677	238,461
	TOTAL	RED	125,782	105,955	105,819	105,119	104,418	103,694	103,058
	TOTAL		425,089	354,970	353,290	350,302	347,339	344,371	341,519

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	1,107,745	796,752	509,443	365,177	286,559	260,210	239,836
Quantity Pumped (annual at each projection date)	Red	84,767	48,126	26,067	12,196	9,990	7,069	5,564
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	1,892,565	1,200,172	496,656	204,552	134,266	125,400	118,429
Quantity Pumped (annual at each projection date)	BRAZOS	180,762	114,628	60,373	19,536	4,285	2,651	2,642

<b>SWISHER County</b>									
Municipal	COUNTY-OTHER	BRAZOS	41	41	42	41	41	40	38
Municipal	COUNTY-OTHER	RED	207	211	211	211	207	202	193
Municipal	HAPPY	RED	107	109	110	111	110	108	103
Municipal	KRESS	BRAZOS	21	22	22	22	22	21	20
Municipal	KRESS	RED	80	82	82	83	81	79	76
Municipal	TULIA	RED	1,020	1,050	1,065	1,072	1,064	1,038	993
Municipal	Total		1,476	1,515	1,532	1,540	1,525	1,488	1,423
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		RED	0	0	0	0	0	0	0
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		RED	0	0	0	0	0	0	0
Irrigation		BRAZOS	73,834	66,689	63,892	65,929	65,552	65,178	64,805
Irrigation		RED	97,872	88,400	84,693	87,393	86,894	86,397	85,904
Mining		BRAZOS	0	0	0	0	0	0	0
Mining		RED	0	0	0	0	0	0	0
Livestock		BRAZOS	212	255	286	302	318	335	353
Livestock		RED	2,909	3,502	3,930	4,140	4,363	4,600	4,852
	TOTAL	BRAZOS	74,108	67,007	64,242	66,294	65,933	65,574	65,216
	TOTAL	RED	102,195	93,354	90,091	93,010	92,719	92,424	92,121
	TOTAL		176,303	160,361	154,333	159,304	158,652	157,998	157,337

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	Red	6,819,588	6,377,657	5,725,090	5,127,016	4,605,948	4,378,512	4,174,484
Quantity Pumped (annual at each projection date)	Red	97,442	93,170	84,809	75,784	66,827	64,355	63,614
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	749,269	438,658	111,975	29,204	16,981	13,621	9,933
Quantity Pumped (annual at each projection date)	BRAZOS	66,489	59,724	23,582	2,488	1,098	533	531

**TERRY County**

Municipal	BROWNFIELD	COLORADO	2,593	2,747	2,905	3,047	3,181	3,185	3,167
Municipal	COUNTY-OTHER	BRAZOS	13	14	14	15	16	15	15
Municipal	COUNTY-OTHER	COLORADO	362	376	393	407	419	418	415
Municipal	MEADOW	COLORADO	70	73	75	78	80	79	79
Municipal	Total		3,038	3,210	3,387	3,547	3,696	3,697	3,676
Manufacturing		BRAZOS	0	0	0	0	0	0	0
Manufacturing		COLORADO	1	1	1	1	1	1	1
Steam-Electric		BRAZOS	0	0	0	0	0	0	0
Steam-Electric		COLORADO	0	0	0	0	0	0	0
Irrigation		BRAZOS	10,157	6,350	6,025	5,716	5,423	5,145	4,881
Irrigation		COLORADO	192,984	120,659	114,472	108,603	103,036	97,753	92,741
Mining		BRAZOS	0	0	0	0	0	0	0
Mining		COLORADO	930	554	266	155	66	0	0
Livestock		BRAZOS	3	5	7	7	8	8	8
Livestock		COLORADO	116	196	276	279	281	285	288
	TOTAL	BRAZOS	10,173	6,369	6,046	5,738	5,447	5,168	4,904
	TOTAL	COLORADO	197,056	124,606	118,388	112,570	107,064	101,721	96,691
	TOTAL		207,229	130,975	124,434	118,308	112,511	106,889	101,595

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	447,345	424,035	403,426	383,304	435,139	400,547	374,030
Quantity Pumped (annual at each projection date)	BRAZOS	8,237	6,069	5,756	5,461	4,704	4,713	4,719
Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	4,129,436	3,737,389	3,397,878	3,179,834	2,993,744	3,120,368	3,245,025
Quantity Pumped (annual at each projection date)	COLORADO	158,282	113,165	86,251	67,983	54,595	54,570	54,553

**YOAKUM County**

Municipal	COUNTY-OTHER	COLORADO	264	286	305	314	323	312	302
Municipal	DENVER CITY	COLORADO	955	1,043	1,126	1,172	1,220	1,181	1,141
Municipal	PLAINS	COLORADO	378	416	448	468	488	473	457
Municipal	Total		1,597	1,745	1,879	1,954	2,031	1,966	1,900
Manufacturing		COLORADO	0	0	0	0	0	0	0
Steam-Electric		COLORADO	1,852	2,597	3,718	4,346	5,113	6,047	7,186
Irrigation		COLORADO	127,059	96,982	92,340	87,920	83,712	79,705	75,890
Mining		COLORADO	3,159	2,416	1,524	706	204	56	0
Livestock		COLORADO	214	218	273	278	282	288	293
	TOTAL		133,881	103,958	99,734	95,204	91,342	88,062	85,269

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	2,535,125	2,315,236	2,139,844	2,058,838	2,022,227	2,044,589	2,066,814
Quantity Pumped (annual at each projection date)	COLORADO	96,729	59,042	36,508	25,975	20,122	19,284	19,012

TOTAL	CANADIAN	102	131	153	161	169	177	186
TOTAL	RED	940,654	709,498	692,903	680,146	664,749	649,824	635,618
TOTAL	BRAZOS	2,617,724	2,105,256	2,041,256	1,984,330	1,927,066	1,874,135	1,824,353
TOTAL	COLORADO	971,601	724,676	686,733	651,095	617,641	586,525	558,280
TOTAL	TOTAL	4,530,081	3,539,561	3,421,045	3,315,732	3,209,625	3,110,661	3,018,437

**SUPPLY INFORMATION**

Quantity in Storage (in 2004, enter in 2000 col.)	CANADIAN	2,599	1,798	894	684	684	684	684
Quantity Pumped (annual at each projection date)	CANADIAN	171	112	74	0	0	0	0
Quantity in Storage (in 2004, enter in 2000 col.)	RED	28,068,284	25,013,653	21,406,705	18,622,337	16,682,812	16,044,399	15,515,606
Quantity Pumped (annual at each projection date)	RED	738,342	540,361	410,193	301,997	224,550	211,917	200,889
Quantity in Storage (in 2004, enter in 2000 col.)	BRAZOS	62,212,978	55,234,785	47,698,717	42,396,385	37,880,916	34,806,693	36,854,270
Quantity Pumped (annual at each projection date)	BRAZOS	1,986,038	1,588,026	1,286,805	956,947	676,569	600,014	559,631
Quantity in Storage (in 2004, enter in 2000 col.)	COLORADO	30,450,745	28,246,647	26,125,838	24,753,718	23,845,033	24,053,386	24,238,740
Quantity Pumped (annual at each projection date)	COLORADO	739,978	529,513	366,752	282,549	222,140	206,956	200,833
Quantity in Storage (in 2004, enter in 2000 col.)	TOTAL	120,734,606	108,496,883	95,232,154	85,773,124	78,409,445	74,905,162	76,609,300
Quantity Pumped (annual at each projection date)	TOTAL	3,464,529	2,658,012	2,063,825	1,541,493	1,123,259	1,018,887	961,354

<b>BASIN</b>								
CANADIAN Basin	Municipal	0	1	1	1	1	1	1
CANADIAN Basin	Manufacturing	0	0	0	0	0	0	0
CANADIAN Basin	Steam-Electric	0	0	0	0	0	0	0
CANADIAN Basin	Irrigation	0	0	0	0	0	0	0
CANADIAN Basin	Mining	0	0	0	0	0	0	0
CANADIAN Basin	Livestock	102	130	152	160	168	176	185
CANADIAN Basin	TOTAL	102	131	153	161	169	177	186
RED Basin	Municipal	7,548	7,875	8,177	8,378	8,474	8,417	8,301
RED Basin	Manufacturing	3,404	3,999	4,338	4,616	4,884	5,116	5,474
RED Basin	Steam-Electric	0	0	0	0	0	0	0
RED Basin	Irrigation	909,585	672,094	650,427	635,776	618,509	601,809	585,660
RED Basin	Mining	85	50	24	14	6	0	0
RED Basin	Livestock	20,032	25,480	29,937	31,362	32,876	34,482	36,183
RED Basin	TOTAL	940,654	709,498	692,903	680,146	664,749	649,824	635,618
BRAZOS Basin	Municipal	68,499	71,548	73,708	74,315	73,668	73,641	72,420
BRAZOS Basin	Manufacturing	6,558	7,659	8,281	8,786	9,267	9,678	10,362
BRAZOS Basin	Steam-Electric	23,766	23,048	22,103	25,842	30,398	35,953	42,724
BRAZOS Basin	Irrigation	2,497,120	1,977,352	1,907,861	1,845,808	1,783,840	1,724,278	1,667,010
BRAZOS Basin	Mining	5,630	3,681	2,141	1,351	530	23	2
BRAZOS Basin	Livestock	16,151	21,968	27,162	28,228	29,363	30,562	31,835
BRAZOS Basin	TOTAL	2,617,724	2,105,256	2,041,256	1,984,330	1,927,066	1,874,135	1,824,353
COLORADO Basin	Municipal	11,315	11,995	12,621	13,058	13,371	13,145	12,864
COLORADO Basin	Manufacturing	102	120	130	138	145	151	163
COLORADO Basin	Steam-Electric	1,852	2,597	3,718	4,346	5,113	6,047	7,186
COLORADO Basin	Irrigation	941,172	695,692	660,211	626,548	594,610	564,308	535,557
COLORADO Basin	Mining	15,721	12,593	8,115	4,994	2,316	705	256
COLORADO Basin	Livestock	1,439	1,679	1,938	2,011	2,086	2,169	2,254
COLORADO Basin	TOTAL	971,601	724,676	686,733	651,095	617,641	586,525	558,280
REGION O	Municipal	87,362	91,419	94,507	95,752	95,514	95,204	93,586
REGION O	Manufacturing	10,064	11,778	12,749	13,540	14,296	14,945	15,999
REGION O	Steam-Electric	25,618	25,645	25,821	30,188	35,511	42,000	49,910
REGION O	Irrigation	4,347,877	3,345,138	3,218,499	3,108,132	2,996,959	2,890,395	2,788,227
REGION O	Mining	21,436	16,324	10,280	6,359	2,852	728	258
REGION O	Livestock	37,724	49,257	59,189	61,761	64,493	67,389	70,457
REGION O	TOTAL	4,530,081	3,539,561	3,421,045	3,315,732	3,209,625	3,110,661	3,018,437