

Appendix

Draft Management Plan 2010

Maps of the Aquifers of Nolan County

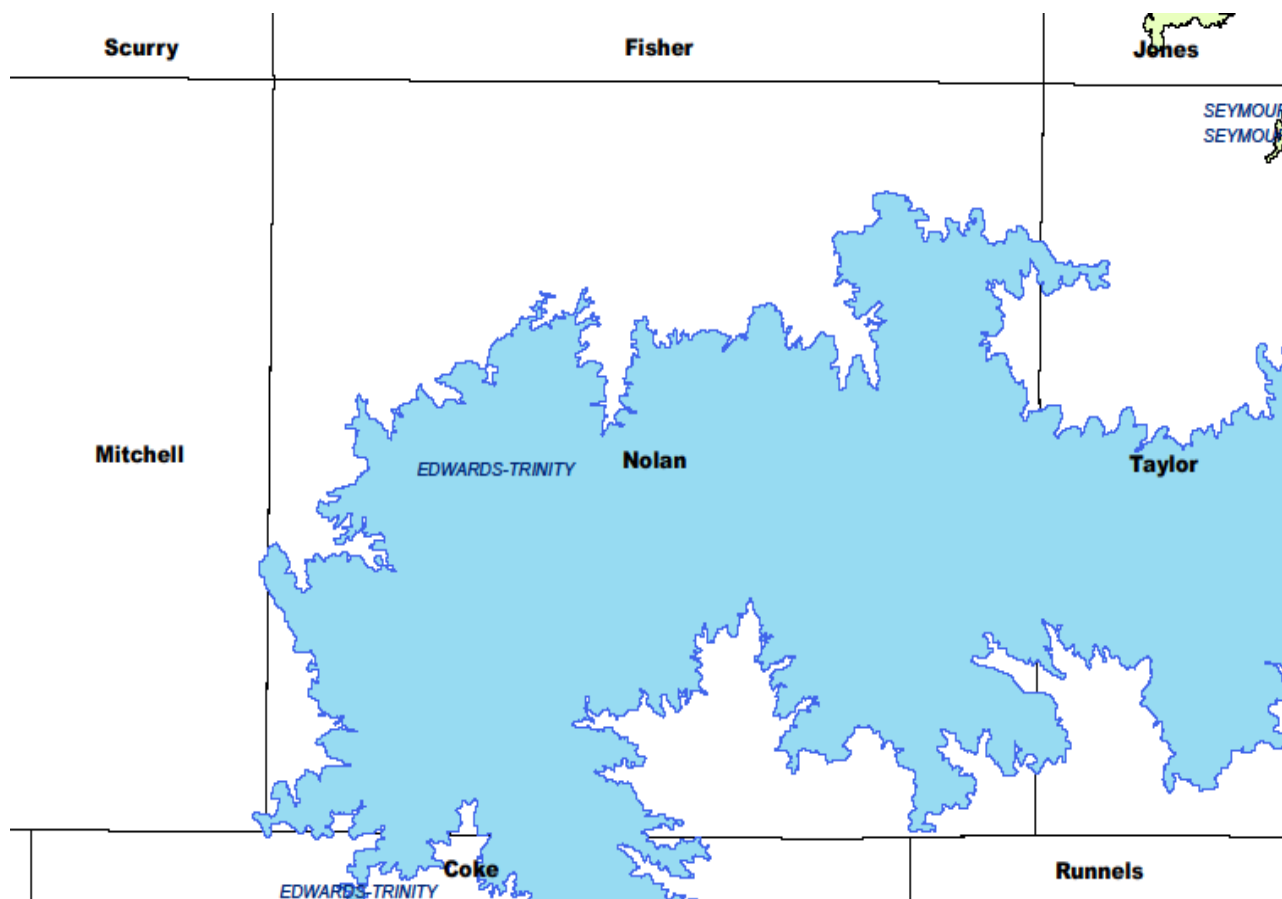
Tables

1. 2007 State Water Plan – Projected Surface Water Supplies
2. Groundwater Availability Water Budget
3. Groundwater Availability and Supply in acre-feet/year taken from 2006 Brazos G Regional Water Plan
4. Historical Water Use Estimate Summary – TWDB Water Use Survey
5. Historical Groundwater Pumpage Summary – TWDB Water Use Survey
6. 2007 State Water Plan – Projected Water Demands
7. 2007 State Water Plan – Projected Water Needs
8. 2007 State Water Plan – Projected Water Management Strategies

Certified Copy of District Resolution Adopting the Management Plan
{31 TAC §356.6(a)(2)}

Evidence of Management Plan Adoption after Notice and Hearing
{31 TAC §356.6(a)(3)}

Letter from the City of Sweetwater granting permission to use study
completed by LBG-Guyton (1997)



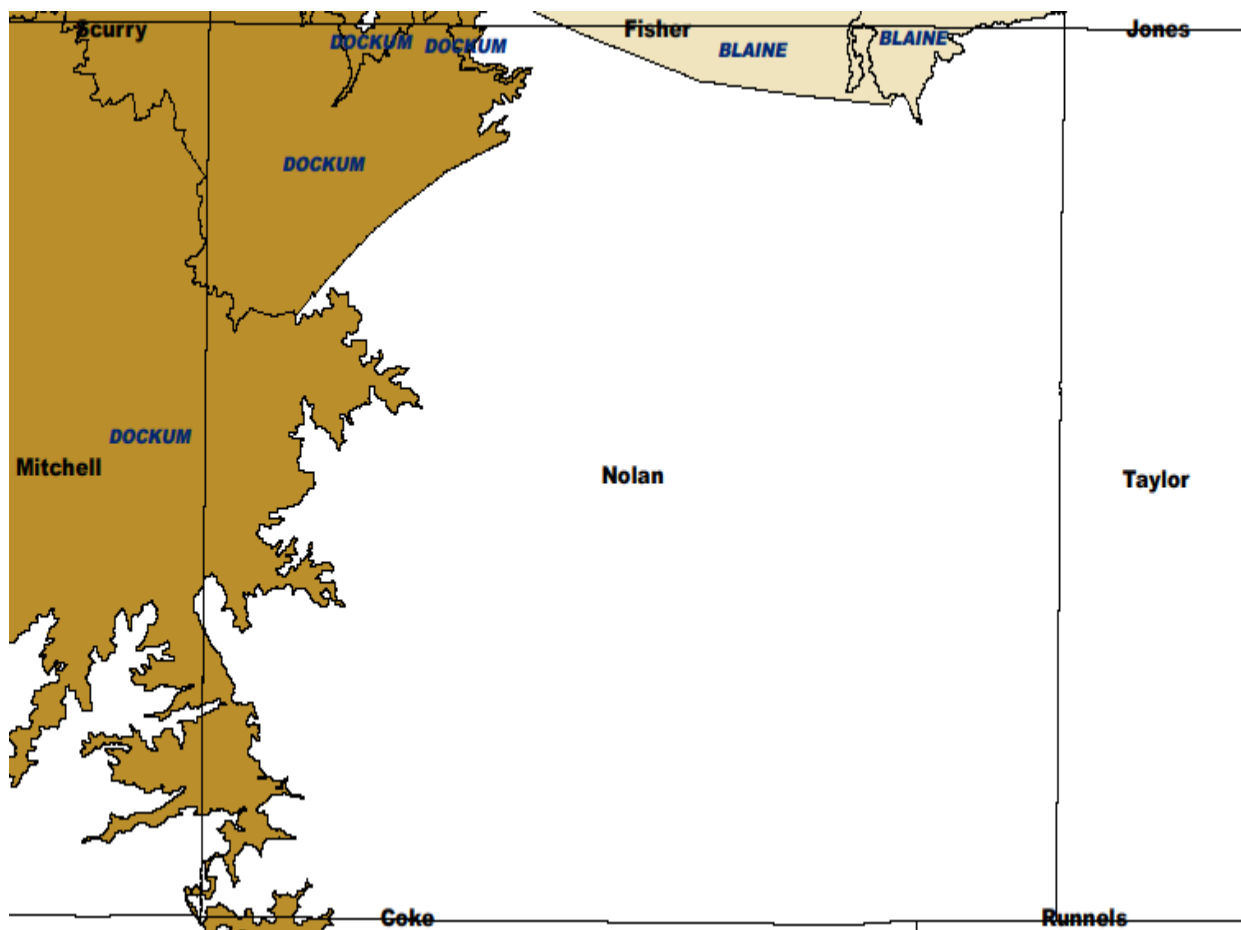


TABLE 1

**2007 State Water Plan
Projected Surface Water Supplies
Nolan County**

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
G	Bitter Creek WSC	Nolan	Brazos	Brazos River Run-of-River	118	118	116	112	106	101
G	Bitter Creek WSC	Nolan	Colorado	Brazos River Run-of-River	10	9	11	14	19	24
G	County Other	Nolan	Brazos	Brazos River Run-of-River	71	71	72	74	78	82
G	County Other	Nolan	Colorado	Brazos River Run-of-River	97	96	94	91	86	82
G	County Other	Nolan	Colorado	Oak Creek Lake/Reservoir	0	0	0	0	0	0
G	Irrigation	Nolan	Brazos	Brazos River Combined Run-of-River Irrigation	120	120	120	120	120	120
G	Livestock	Nolan	Brazos	Livestock Local Supply	223	223	223	223	223	223
G	Livestock	Nolan	Colorado	Livestock Local Supply	241	241	241	241	241	241
G	Manufacturing	Nolan	Brazos	Sweetwater Lake/Reservoir	305	303	302	300	298	297
G	Steam Electric Power	Nolan	Brazos	Sweetwater Lake/Reservoir	443	441	439	436	434	432
G	Sweetwater	Nolan	Brazos	Oak Creek Lake/Reservoir	0	0	0	0	0	0
G	Sweetwater	Nolan	Brazos	Sweetwater Lake/Reservoir	0	0	0	0	0	0
Total Projected Surface Water Supplies (acre-feet per year) =					1,628	1,622	1,618	1,611	1,605	1,602

Source: Volume 3, 2007 State Water Planning Database
(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

3/9/2009

TABLE 2**GROUNDWATER AVAILABILITY MODEL WATER BUDGET**

Management Plan requirement	Aquifer or confining unit	Results (acre-feet/year)
Estimated annual amount of recharge from precipitation to the district	undifferentiated Edwards-Trinity aquifers	11,480
	Lower portion of the Dockum Aquifer	7135
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	undifferentiated Edwards-Trinity aquifers	10,840
	Lower portion of the Dockum Aquifer	516
Estimated annual volume of flow into the district within each aquifer in the district	undifferentiated Edwards-Trinity aquifers	214
	Lower portion of the Dockum Aquifer	84
Estimated annual volume of flow out of the district within each aquifer in the district	undifferentiated Edwards-Trinity aquifers	1,199
	Lower portion of the Dockum Aquifer	321
Estimated net annual volume of flow between each aquifer in the district	Between Edwards and associated limestones and the undifferentiated Trinity Group*	0
	Between overlying units and the lower portion of the Dockum Aquifer*	0

Source: Groundwater Availability Model 09-013
www.twdb.state.tx.us/Gam/GAMruns/GR09-13.pdf

*Note: only Layer 3 of the Dockum Aquifer is represented and Layer 2 of the Edwards-Trinity (Plateau) Aquifer is saturated in the district for the respective groundwater availability models. Therefore, this term is zero due to the absence of any overlying units or saturated layer for each model.

TABLE 3

**GROUNDWATER AVAILABILITY AND SUPPLY IN ACRE-FEET/
YEAR
TAKEN FROM 2006 BRAZOS G REGIONAL WATER PLAN**

<u>Aquifer</u>	<u>Availability</u>	<u>2010 supply</u>	<u>2060 supply</u>
Dockum	3500	3500	3500
Edwards – Trinity	1000	836	836
Total	4500	4336	4336

TABLE 4

Historical Water Use Estimate Summary
TWDB - Water Use Survey
Nolan County
Unit: Acre Feet (ACFT)

GW = groundwater; SW = surface water

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	268	45	0	2,706	811	358	4,188
	SW	2,510	593	0	216	1,031	678	5,028
	Total	2,778	638	0	2,922	1,842	1,036	9,216
1980	GW	1,198	52	0	1,999	311	150	3,710
	SW	3,545	530	0	825	513	596	6,009
	Total	4,743	582	0	2,824	824	746	9,719
1984	GW	1,056	159	0	1,762	382	88	3,447
	SW	3,223	468	0	500	0	797	4,988
	Total	4,279	627	0	2,262	382	885	8,435
1985	GW	914	151	0	1,963	497	80	3,605
	SW	2,320	453	0	553	0	727	4,053
	Total	3,234	604	0	2,516	497	807	7,658
1986	GW	647	102	0	1,260	478	59	2,546
	SW	2,761	458	0	1,073	0	543	4,835
	Total	3,408	560	0	2,333	478	602	7,381
1987	GW	333	43	0	1,066	440	65	1,947
	SW	3,070	479	0	1,065	0	591	5,205
	Total	3,403	522	0	2,131	440	656	7,152
1988	GW	821	95	0	1,281	406	63	2,666
	SW	3,261	454	0	1,282	0	569	5,566
	Total	4,082	549	0	2,563	406	632	8,232
1989	GW	1,318	123	0	2,049	378	61	3,929
	SW	4,675	438	0	441	0	560	6,114
	Total	5,993	561	0	2,490	378	621	10,043
1990	GW	1,236	145	0	1,791	378	61	3,611
	SW	2,766	354	0	94	0	564	3,778
	Total	4,002	499	0	1,885	378	625	7,389
1991	GW	1,118	94	0	1,475	415	65	3,167
	SW	3,798	370	0	78	0	578	4,824
	Total	4,916	464	0	1,553	415	643	7,991
1992	GW	589	54	0	1,089	415	90	2,237
	SW	3,839	418	0	363	0	815	5,435
	Total	4,428	472	0	1,452	415	905	7,672
1993	GW	621	78	0	2,280	415	94	3,488
	SW	2,091	362	0	500	0	849	3,802
	Total	2,712	440	0	2,780	415	943	7,290
1994	GW	591	77	0	2,080	415	94	3,257
	SW	2,558	356	0	499	0	845	4,258
	Total	3,149	433	0	2,579	415	939	7,515
1995	GW	663	89	0	1,437	277	111	2,577
	SW	2,314	443	0	315	0	1,001	4,073
	Total	2,977	532	0	1,752	277	1,112	6,650
1996	GW	657	60	0	2,644	277	177	3,815
	SW	3,474	510	0	581	0	1,593	6,158
	Total	4,131	570	0	3,225	277	1,770	9,973

1997	GW	438	36	0	1,562	277	101	2,414
	SW	3,799	546	0	343	0	914	5,602
	Total	4,237	582	0	1,905	277	1,015	8,016
1998	GW	488	62	0	1,431	277	75	2,333
	SW	4,418	555	0	314	0	673	5,960
	Total	4,906	617	0	1,745	277	748	8,293
1999	GW	477	62	0	1,604	277	55	2,475
	SW	2,500	549	0	655	0	493	4,197
	Total	2,977	611	0	2,259	277	548	6,672
2000	GW	782	80	0	4,894	277	46	6,079
	SW	2,728	563	0	382	0	418	4,091
	Total	3,510	643	0	5,276	277	464	10,170
2001	GW	323	33	0	2,841	229	22	3,448
	SW	3,799	504	0	214	0	416	4,933
	Total	4,122	537	0	3,055	229	438	8,381
2002	GW	360	32	0	2,865	229	22	3,508
	SW	4,236	491	0	216	0	410	5,353
	Total	4,596	523	0	3,081	229	432	8,861
2003	GW	304	33	0	3,158	229	14	3,738
	SW	3,579	495	0	13	0	268	4,355
	Total	3,883	528	0	3,171	229	282	8,093
2004	GW	191	35	0	4,138	229	16	4,609
	SW	2,253	526	0	93	0	301	3,173
	Total	2,444	561	0	4,231	229	317	7,782

NOTE: All Pumpage reported in acre-feet

3/9/2009

TABLE 5

Historical Groundwater Pumpage Summary
TWDB - Water Use Survey
Nolan County

Unit: Acre Feet (ACFT)

Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1980	DOCKUM	378	0	0	1,498	106	34	2,016
	EDWARDS-TRINITY PLATEAU	787	45	0	295	62	71	1,260
	OTHER	33	7	0	206	143	45	434
	Total	1,198	52	0	1,999	311	150	3,710
1984	DOCKUM	322	0	0	1,360	80	20	1,782
	EDWARDS-TRINITY PLATEAU	850	43	0	250	90	40	1,273
	OTHER	24	35	0	152	212	28	451
	Total	1,196	78	0	1,762	382	88	3,506
1985	DOCKUM	369	0	0	1,515	45	18	1,947
	EDWARDS-TRINITY PLATEAU	717	54	0	278	111	37	1,197
	OTHER	24	0	0	170	341	25	560
	Total	1,110	54	0	1,963	497	80	3,704
1986	DOCKUM	282	0	0	972	43	14	1,311
	EDWARDS-TRINITY PLATEAU	468	44	0	178	106	27	823
	OTHER	8	0	0	109	329	18	464
	Total	758	44	0	1,259	478	59	2,598
1987	DOCKUM	315	0	0	822	40	14	1,191
	EDWARDS-TRINITY PLATEAU	26	42	0	151	98	30	347
	OTHER	12	1	0	92	302	20	427
	Total	353	43	0	1,065	440	64	1,965
1988	DOCKUM	510	0	0	988	36	14	1,548
	EDWARDS-TRINITY PLATEAU	471	46	0	181	91	29	818
	OTHER	20	0	0	111	279	20	430
	Total	1,001	46	0	1,280	406	63	2,796
1989	DOCKUM	546	0	0	1,566	34	14	2,160
	EDWARDS-TRINITY PLATEAU	1,002	44	0	295	84	29	1,454
	OTHER	15	0	0	188	259	19	481
	Total	1,563	44	0	2,049	377	62	4,095
1990	DOCKUM	490	0	0	1,382	35	14	1,921
	EDWARDS-TRINITY PLATEAU	1,019	40	0	254	84	28	1,425
	OTHER	36	0	0	155	259	19	469
	Total	1,545	40	0	1,791	378	61	3,815

1991	DOCKUM	477	0	0	1,138	20	14	1,649
	EDWARDS-TRINITY PLATEAU	892	28	0	209	94	30	1,253
	OTHER	37	0	0	127	302	21	487
	Total	1,406	28	0	1,474	416	65	3,389
1992	DOCKUM	425	0	0	841	19	20	1,305
	EDWARDS-TRINITY PLATEAU	261	36	0	154	94	42	587
	OTHER	36	0	0	94	302	29	461
	Total	722	36	0	1,089	415	91	2,353
1993	DOCKUM	442	0	0	1,769	19	20	2,250
	EDWARDS-TRINITY PLATEAU	285	48	0	320	94	43	790
	OTHER	39	0	0	191	302	30	562
	Total	766	48	0	2,280	415	93	3,602
1994	DOCKUM	429	0	0	1,760	19	20	2,228
	EDWARDS-TRINITY PLATEAU	260	52	0	0	94	43	449
	OTHER	37	0	0	320	302	30	689
	Total	726	52	0	2,080	415	93	3,366
1995	DOCKUM	387	0	0	1,217	19	24	1,647
	EDWARDS-TRINITY PLATEAU	368	43	0	0	62	51	524
	OTHER	47	0	0	220	196	35	498
	Total	802	43	0	1,437	277	110	2,669
1996	DOCKUM	410	0	0	2,240	19	38	2,707
	EDWARDS-TRINITY PLATEAU	327	28	0	0	62	82	499
	OTHER	45	0	0	404	196	56	701
	Total	782	28	0	2,644	277	176	3,907
1997	DOCKUM	393	0	0	1,323	19	22	1,757
	EDWARDS-TRINITY PLATEAU	64	36	0	0	62	47	209
	OTHER	45	0	0	239	196	33	513
	Total	502	36	0	1,562	277	102	2,479
1998	DOCKUM	437	0	0	1,212	19	16	1,684
	EDWARDS-TRINITY PLATEAU	71	46	0	0	62	35	214
	OTHER	50	0	0	219	196	24	489
	Total	558	46	0	1,431	277	75	2,387
1999	DOCKUM	428	0	0	1,359	19	12	1,818
	EDWARDS-TRINITY PLATEAU	70	46	0	0	62	25	203
	OTHER	49	0	0	245	196	18	508
	Total	547	46	0	1,604	277	55	2,529
2000	DOCKUM	701	0	0	4,145	19	10	4,875
	EDWARDS-TRINITY PLATEAU	114	70	0	0	62	22	268
	OTHER	81	0	0	748	196	15	1,040
	Total	896	70	0	4,893	277	47	6,183
2001	DOCKUM	286	0	0	1,933	19	10	2,248

	EDWARDS-TRINITY PLATEAU	93	75	0	0	62	20	250
	OTHER	51	0	0	908	196	14	1,169
	Total	430	75	0	2,841	277	44	3,667
2002	DOCKUM	301	0	0	1,950	19	10	2,280
	EDWARDS-TRINITY PLATEAU	95	78	0	0	62	20	255
	OTHER	53	0	0	915	196	14	1,178
	Total	449	78	0	2,865	277	44	3,713
2003	DOCKUM	305	0	0	2,151	19	40	2,515
	EDWARDS-TRINITY PLATEAU	93	78	0	0	62	87	320
	OTHER	55	0	0	1,007	196	61	1,319
	Total	453	78	0	3,158	277	188	4,154

NOTE: All Pumpage reported in acre-feet

3/9/2009

Source: TWDB Water Use Survey Database (<http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2>)

TABLE 6

**2007 State Water Plan
Projected Water Demands
Nolan County**

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
G	Bitter Creek WSC	Nolan	Brazos	118	118	116	112	106	101
G	Bitter Creek WSC	Nolan	Colorado	4	4	4	3	3	3
G	County Other	Nolan	Brazos	102	101	99	95	91	86
G	County Other	Nolan	Colorado	97	96	94	91	86	82
G	Irrigation	Nolan	Brazos	1,747	1,701	1,656	1,612	1,570	1,529
G	Irrigation	Nolan	Colorado	3,391	3,302	3,215	3,129	3,048	2,968
G	Livestock	Nolan	Brazos	223	223	223	223	223	223
G	Livestock	Nolan	Colorado	241	241	241	241	241	241
G	Manufacturing	Nolan	Brazos	779	915	1,038	1,159	1,266	1,372
G	Mining	Nolan	Brazos	253	253	253	253	253	253
G	Mining	Nolan	Colorado	25	25	25	25	25	25
G	Roscoe	Nolan	Brazos	189	190	188	182	173	165
G	Steam Electric Power	Nolan	Brazos	1,315	1,882	2,200	2,588	3,061	3,638
G	Sweetwater	Nolan	Brazos	3,013	3,072	3,081	3,029	2,900	2,763
Total Projected Water Demands (acre-feet per year) =				11,497	12,123	12,433	12,742	13,046	13,449

Source: Volume 3, 2007 State Water Planning Database

(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

TABLE 7

**2007 State Water Plan
Projected Water Needs
Nolan County**

Positive values reflect a water surplus; **negative values reflect a water need.**

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
G	Bitter Creek WSC	Nolan	Brazos	0	0	0	0	0	0
G	Bitter Creek WSC	Nolan	Colorado	6	5	7	11	16	21
G	County Other	Nolan	Brazos	-31	-30	-27	-21	-13	-4
G	County Other	Nolan	Colorado	0	0	0	0	0	0
G	Irrigation	Nolan	Brazos	-1,227	-1,190	-1,153	-1,118	-1,084	-1,051
G	Irrigation	Nolan	Colorado	-1,937	-1,848	-1,761	-1,676	-1,595	-1,515
G	Livestock	Nolan	Brazos	0	0	0	0	0	0
G	Livestock	Nolan	Colorado	0	0	0	0	0	0
G	Manufacturing	Nolan	Brazos	362	224	100	-23	-132	-239
G	Mining	Nolan	Brazos	-186	-185	-185	-184	-184	-184
G	Mining	Nolan	Colorado	-14	-14	-14	-13	-13	-13
G	Roscoe	Nolan	Brazos	-45	-45	-42	-36	-26	-17
G	Steam Electric Power	Nolan	Brazos	-492	-1,059	-1,377	-1,767	-2,240	-2,817
G	Sweetwater	Nolan	Brazos	-1,969	-2,023	-2,027	-1,969	-1,835	-1,693
Total Projected Water Needs (acre-feet per year) =				-5,901	-6,394	-6,586	-6,807	-7,122	-7,533
Source: Volume 3, 2007 State Water Planning Database									3/9/2009

(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

TABLE 8

2007 State Water Plan
 Projected Water Management Strategies
 Nolan County - Region G

WUG	River Basin	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
Mining	Brazos	Brackish Groundwater	Edwards-Trinity Plateau Aquifer	Nolan	186	186	186	187	187	187
Mining	Colorado	Brackish Groundwater	Edwards-Trinity Plateau Aquifer	Nolan	14	14	14	13	13	13
Irrigation	Brazos	Brush Control and Range Management	Brush Control	Nolan	0	0	0	0	0	0
Irrigation	Colorado	Brush Control and Range Management	Brush Control	Nolan	0	0	0	0	0	0
County Other	Brazos	Champion Well Field - Phases 1 & 2	Dockum Aquifer	Mitchell	50	50	50	50	50	50
Manufacturing	Brazos	Champion Well Field - Phases 1 & 2	Dockum Aquifer	Mitchell	0	0	0	0	150	150
Steam Electric Power	Brazos	Champion Well Field - Phases 1 & 2	Dockum Aquifer	Mitchell	0	700	700	1,100	1,500	2,000
Sweetwater	Brazos	Champion Well Field - Phases 1 & 2	Dockum Aquifer	Mitchell	1,264	831	550	1,260	796	736
Irrigation	Brazos	Irrigation Water Conservation	Conservation	Nolan	60	98	135	133	131	129
Irrigation	Colorado	Irrigation Water Conservation	Conservation	Nolan	94	152	206	199	192	186
Manufacturing	Brazos	Manufacturing Water Conservation	Conservation	Nolan	23	46	73	81	89	96
Mining	Brazos	Mining Water Conservation	Conservation	Nolan	7	13	18	18	18	18
Mining	Colorado	Mining Water Conservation	Conservation	Nolan	1	1	1	1	1	1
Sweetwater	Brazos	Municipal Water Conservation	Conservation	Nolan	94	195	156	113	95	91
Roscoe	Brazos	Reallocation of Source	Dockum Aquifer	Nolan	50	50	50	50	50	50
Steam Electric Power	Brazos	Steam-Electric Conservation	Conservation	Nolan	39	94	154	181	214	257
Sweetwater	Brazos	Subordination	Oak Creek Lake/Reservoir	Reservoir	1,679	1,671	1,557	1,435	1,301	1,154
Steam Electric Power	Brazos	Wastewater Reuse	Direct Reuse	Nolan	560	560	560	560	560	560
Sweetwater	Brazos	Wastewater Reuse	Direct Reuse	Nolan	560	560	560	560	560	560
Irrigation	Brazos	Weather Modification	Weather Modification	Nolan	0	0	0	0	0	0
Irrigation	Colorado	Weather Modification	Weather Modification	Nolan	0	0	0	0	0	0
total projected water mgmt strategies - acre-ft/year					4,681	5,221	4,970	5,941	5,907	6,238

Source: Volume 3, 2007 State Water Planning Database <http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>