

Wintergarden Groundwater Conservation District Management Plan

(Adopted 11/17/05)

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Purpose and Intent

It is the purpose and intent of this plan to establish policy in the area of water conservation, public information, regulations, permits and enforcement, equity and discretion, and cooperation and coordination, and will be in effect from adoption by notice and hearing until 2015. The goal of this plan is to establish a Regulatory Action Plan that will conserve, preserve, protect and prevent the waste of the underground water within the District. Due to the present potential mining of groundwater in the Carrizo aquifer in some areas of the District, the Regulatory Action Plan will also address reducing the mining of groundwater. The regulations and policies in this plan have been established so that the goals, needs and obligations of the District may be accomplished as set forth by the 75th Legislature, Regular Session 1997, House Bill 3602, and Chapter 36 of the Texas Water Code.

Background

The Wintergarden Groundwater Conservation District was created in 1997 by HB 3602 75th Leg. in accordance with Section 59, Article 16 of the Constitution of the State of Texas, and in accordance with the Texas Water Code Title 2 Water Administration Subtitle E Groundwater Management (ch. 35 & 36). The Wintergarden Groundwater Conservation District was confirmed by election in January 1998. The election was successful and a tax rate of \$0.04 per \$100.00 valuation was set.

The District encompasses all of Dimmit, LaSalle, & Zavala Counties. This includes approximately 2,685,148 acres, or 4,195 square miles. The District economy is heavily dependent on agriculture and agriculture related business. Rainfall of 20.0 inches annually usually peaks in the late spring, with a secondary peak in the early fall. Due to this trend and high summer temperatures, irrigation is required for consistent crop production and yield. Approximately 90.7% of the total groundwater pumpage in the District is used in agriculture.

Last 5 years average per county of acre-foot used for agriculture as follows:

Dimmit	5616 AF	8.4%
LaSalle	6418 AF	9.6%
Zavala	55,148 AF	82.1%

Policy

It is the Policy of the District to promote water conservation, provide public information, maintain and sustain regulation, permits, enforcement, equity and discretion, cooperation and coordination. These policies are designed to support the regulation of groundwater withdrawals to reduce the mining of groundwater resources within the District and to protect groundwater within the District as a sustainable resource for the benefit of those who rely upon it both inside and outside the District. The implementation of this plan can only be achieved through a concerted effort by all parties that use groundwater within the District and the Carrizo Aquifer. The Wintergarden Groundwater Conservation District Policy also provides that it will encourage any groundwater conservation district overlying the Carrizo Aquifer from approving the mining or export of groundwater from the aquifer boundaries that would result in the degradation of groundwater (levels or quality) within the Wintergarden Groundwater Conservation District boundaries. In the event groundwater is mined or exported for use outside the aquifer boundaries by a groundwater district other the Wintergarden Groundwater Conservation District (“the mining/or exporting district”) and such use would result in the degradation of groundwater (levels or quality) within the Wintergarden Groundwater Conservation District boundaries, the Wintergarden Groundwater Conservation District shall demand that the mining/or exporting district shall, at no

cost to the Wintergarden Groundwater Conservation District, implement a recharge plan to the satisfaction of the Wintergarden Groundwater Conservation District and within the Wintergarden Groundwater Conservation District that will maintain the safe yield and current level of the aquifer at the level currently in existence prior to the mining/or exporting action. The District shall maintain an office with regular office hours.

Management of Groundwater Supplies

The District will manage the supply of groundwater within the District in order to conserve the resource while seeking to maintain the economic viability of all resource user groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices, that if implemented, would result in a reduction of groundwater use. An observation network shall be established and maintained by the District in order to monitor changing storage conditions of groundwater supplies within the District. The District will make a regular assessment of water supply and groundwater storage conditions and will report those conditions to the Board and to the public. The District will undertake, as necessary, and cooperate with investigations of the groundwater resources within the District and will make the results of the investigations available to the public upon adoption by the Board.

The District will adopt rules to regulate groundwater withdrawals by means of spacing and production limits. In making a determination, the District may deny a well construction permit or limit groundwater withdrawals in accordance with the guidelines stated in the rules of the District.

Technical Research and Studies

The District, in cooperation with other entities including the Texas Water Development Board and the Texas Commission on Environmental Quality, will work to determine methods to conserve and protect groundwater through more efficient irrigation practices, education, and well head protection. The District will be collecting well data from five (5) full-time monitors placed in Carrizo Aquifer wells in order to determine the current level in the aquifer and the effects of the current usage by the year 2006.

Water Conservation

Water conservation has become a strong initiative throughout the State of Texas. New buildings are required to use certain water conserving plumbing fixtures as a result of legislation passed by the Texas Legislature in 1991. It has been recognized that fresh water is a vital commodity that can only last through preservation. The District may require a conservation plan for permitted wells in order to be sure that the groundwater produced is put to a beneficial use, not wasted. The District will work with water utilities, industry, and agriculture users to promote the most efficient use of water so that we may preserve one of our most valuable natural resources. The District will explore other conservation methods and options and will adopt new requirements as they become necessary.

Actions, Procedures, Performance and Avoidance for Plan Implementation

The District will implement the provisions of this plan and will utilize the provisions of this plan as a guidepost for determining the direction or priority for all District activities. All operations of the District, all agreements entered into by the District and any additional planning efforts in which the District may participate will be consistent with the provisions of this plan.

The District will adopt rules relating to the permitting of wells and the production of groundwater. The rules adopted by the District shall be pursuant to TWC Chapter 36 and the provisions of this plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical evidence available.

The District shall treat all citizens with equality. Citizens may apply to the District for discretion in enforcement of the rules on grounds of adverse economic effect or unique local conditions. In exercising enforcement, discretion to any rule, the Board shall consider the potential for adverse effect on adjacent landowners. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board or binding on the Board for that matter or any subsequent matter. The Board shall make such decisions on a case-by-case basis and such decisions shall not establish precedent for any other action that may arise.

The District will seek the cooperation in the implementation of this plan and the management of groundwater supplies within the District. All activities of the District will be undertaken in cooperation and coordinated with the appropriate state, regional or local water management entity.

Groundwater Recharge

This groundwater budget summarizes how the GAM model estimates water entering and leaving the aquifer. The groundwater budget for the steady-state model is shown in Table 1. Lateral flow in and out represents groundwater flowing into and out of the aquifer(s) across county boundaries. Upward leakage to younger layers in Table 1 represents the exchange of groundwater between aquifer formations. Total recharge represents contributions to the aquifer from precipitation entering the system where the geologic unit containing the aquifer is exposed at the land surface. Evapotranspiration in Table 1 represents the process by which plants pull and use water directly from the aquifer. Net stream leakage reflects the interaction of the aquifer with surface water bodies.

The total recharge (rainfall) for Dimmit, La Salle, and Zavala counties from the GAM is 48,452 acre-feet per year. The net recharge, recharge minus evapotranspiration, is 45,050 acre-feet per year.

Table 1. Groundwater flow budget for Dimmit, La Salle, and Zavala counties in the steady-state GAM of the southern part of the Queen City, Sparta, and Carrizo Wilcox aquifers. (TWDB GAM Run 05-34)

<i>Flow Term</i>	<i>Flow (acre-feet/year)</i>
Lateral flow in	28,213 In
Lateral flow out	(-)20,682 Out
Upward leakage to younger layers	(-)14,568 Out
Total recharge	48,452 In – Rainfall
Evapotranspiration	(-) 3,402 Out
Net stream leakage	(-)37,834 Out

In Table 1, a negative sign refers to flow out of the aquifer in Dimmit, La Salle, and Zavala counties and a positive number refers to flow into the aquifer in Dimmit, La Salle, and Zavala counties. All numbers are rounded to the nearest 1 acre-foot. Values are probably only accurate to two significant figures. Based on this table, the total volume leaving the counties under steady-state predevelopment conditions with no pumping is approximately 76,486 acre-feet per year. The 76,486 is also considered annual groundwater availability.

In addition to the above values, WGCD continues to support that recharge can be enhanced by a respectable amount with the implementation of a sound program to artificially recharge the aquifer as well as reduce

pumpage. Since the spring of 1999 and continuing to date, WGCD along with Webb and Uvalde Counties have been actively engaged in an 8-month rain enhancement and hail suppression program which is planned to be reoccurring in future years. The rain enhancement and hail suppression may not only increase the agriculture economic base, but may also increase recharge. It has been reflected in various publications TCEQ, TWDB, and TDLR that cloud seeding may effectively increase rainfall by 12 – 20% thereby increasing recharge by a similar amount and reduce damage from hail-fall.

Groundwater Availability

Estimated annual groundwater availability in the District is 76,486 acre-feet.

All values aforementioned are a product of the Texas Water Development Board (TWDB) GAM run 05-34.

Current and Projected Groundwater Needs/Demands

The WGCD is a three county District consisting of;

Dimmit: Asherton, Big Wells, Brundage, Catarina, and Carrizo Springs

LaSalle: Artesia Wells, Cotulla, Encinal, Fowlerton, Los Angeles, Millett, and Woodward.

Zavala: Batesville, Crystal City, La Pryor

Based on available data from the 2001 Regional Water Plan, annual water uses in the WGCD **District** have been projected to be

Year	Total acre Ft.
2000	133,160
2010	128,572
2020	124,401
2030	120,938
2040	117,484
2050	114,293

Estimated Groundwater pumpage percentages per county of the total usage in the District are as follows:

Dimmit	11.5
LaSalle	7.0
Zavala	81.5

Projected groundwater supply data from the 2005 Texas Water Development Board Data Request and the 2001 Regional Water Plan.

Aquifer	Year 2000	2010	2020	2030	2040	2050
Cz-Wx	76,000	76,000	76,000	68,400	61,560	55,404
Sparta	1,400	1,400	1,400	1,400	1,400	1,400
Queen City	425	425	425	425	425	425

Projected Water Demands (Dimmit, La Salle and Zavala Counties) – Table A (2001 Regional Water Plan)

Dimmit

RWPG	WUG	River Basin	Category	2000	2010	2020	2030	2040	2050
L	Asherton	Nueces	Municipal	211	205	206	224	243	267
L	Big Wells	Nueces	Municipal	165	153	143	146	147	149
L	Carrizo Springs	Nueces	Municipal	2,316	2,583	2,827	3,232	3,657	4,137
L	County-Other	Nueces	Municipal	238	221	211	231	260	280
L	County-Other	Rio Grande	Municipal	6	6	6	6	6	7
L	Irrigation	Nueces	Irrigation	10,551	10,199	9,932	9,828	9,432	9,026
L	Manufacturing	Nueces	Manufacturing	11	11	12	13	14	15
L	Mining	Nueces	Mining	1,003	817	906	916	926	950
L	Livestock	Nueces	Livestock	621	621	621	621	621	621
L	Livestock	Rio Grande	Livestock	150	150	150	150	150	150

Total Projected Water Demands (acre-feet per year) = **15,272** **14,966** **15,014** **15,367** **15,456** **15,602**

La Salle

RWPG	WUG	River Basin	Category	2000	2010	2020	2030	2040	2050
L	Cotulla	Nueces	Municipal	908	934	942	970	1,005	1,040
L	Encinal	Nueces	Municipal	93	75	61	55	51	48
L	County-Other	Nueces	Municipal	371	382	389	397	403	398
L	Irrigation	Nueces	Irrigation	7,067	6,849	6,638	6,433	6,234	6,042
L	Livestock	Nueces	Livestock	1,077	1,077	1,077	1,077	1,077	1,077

Total Projected Water Demands (acre-feet per year) - **9,516** **9,317** **9,107** **8,932** **8,770** **8,605**

Zavala

RWPG	WUG	River Basin	Category	2000	2010	2020	2030	2040	2050
L	Batesville	Nueces	Municipal	212	200	196	204	212	209
L	Crystal City	Nueces	Municipal	2,034	1,948	1,850	1,908	1,902	1,908
L	La Pryor	Nueces	Municipal	238	203	171	157	150	145
L	County-Other	Nueces	Municipal	290	343	357	383	489	658
L	Irrigation	Nueces	Irrigation	103,213	99,135	95,218	91,456	87,842	84,371
L	Livestock	Nueces	Livestock	881	881	881	881	881	881
L	Manufacturing	Nueces	Manufacturing	1,407	1,507	1,582	1,642	1,780	1,914
L	Mining	Nueces	Mining	97	42	25	8	2	0

Total Projected Water Demands (acre-feet per year) = **108,372** **104,259** **100,280** **96,639** **93,258** **90,086**

Surface Water Supplies

The following table shows the projected surface water supplies and groundwater supplies. Currently, Dimmit County has 772 AFY of surface water as opposed to 14,516 AFY of groundwater. La Salle County has 4,369 AFY of surface water as opposed to 5,534 AFY of groundwater. Zavala County has 881 AFY of surface water as opposed to 30,475 AFY of groundwater.

Projected Water Supplies (Dimmit, La Salle, and Zavala Counties) – Table B (2001 Regional Water Plan)

Dimmit

RWPG	WUG	River Basin	Source Type	Source Name	2000	2010	2020	2030	2040	2050
L	Asherton	Nueces	Groundwater	Carrizo-Wilcox Aquifer	294	294	294	294	294	294
L	Big Wells	Nueces	Groundwater	Carrizo-Wilcox Aquifer	189	189	189	189	189	189
L	Carrizo Springs	Nueces	Groundwater	Carrizo-Wilcox Aquifer	2,178	2,178	2,178	2,178	2,178	2,178
L	County-Other	Nueces	Groundwater	Carrizo-Wilcox Aquifer	280	280	280	280	280	280
L	County-Other	Rio Grande	Groundwater	Carrizo-Wilcox Aquifer	7	7	7	7	7	7
L	Irrigation	Nueces	Surface Water	Irrigation Local Supply	4,101	4,101	4,101	4,101	4,101	4,101
L	Irrigation	Nueces	Groundwater	Carrizo-Wilcox Aquifer	6,450	6,098	5,831	5,727	5,331	4,925
L	Livestock	Nueces	Surface Water	Livestock Local Supply	621	621	621	621	621	621
L	Livestock	Rio Grande	Surface Water	Livestock Local Supply	150	150	150	150	150	150
L	Manufacturing	Nueces	Groundwater	Carrizo-Wilcox Aquifer	15	15	15	15	15	15
L	Mining	Nueces	Surface Water	Other Local Supply	1	1	1	1	1	1
L	Mining	Nueces	Groundwater	Carrizo-Wilcox Aquifer	1,002	816	905	915	925	949
Total Projected Water Supplies (acre-feet per year) =					15,288	14,750	14,572	14,478	14,092	13,710

La Salle

RWPG	WUG	River Basin	Source Type	Source Name	2000	2010	2020	2030	2040	2050
L	Cotulla	Nueces	Groundwater	Carrizo-Wilcox Aquifer	1,248	1,248	1,248	1,248	1,248	1,248
L	Encinal	Nueces	Groundwater	Carrizo-Wilcox Aquifer	108	108	108	108	108	108
L	County-Other	Nueces	Groundwater	Carrizo-Wilcox Aquifer	383	383	383	352	352	352
L	County-Other	Nueces	Groundwater	Queen City Aquifer	5	5	5	12	12	12
L	County-Other	Nueces	Groundwater	Sparta Aquifer	15	15	15	39	39	39
L	Irrigation	Nueces	Surface Water	Irrigation Local Supply	3,292	3,292	3,292	3,292	3,292	3,292
L	Irrigation	Nueces	Groundwater	Carrizo-Wilcox Aquifer	3,587	3,380	3,179	2,744	2,571	2,403
L	Irrigation	Nueces	Groundwater	Queen City Aquifer	44	41	39	92	86	81
L	Irrigation	Nueces	Groundwater	Sparta Aquifer	144	136	128	305	285	266
L	Livestock	Nueces	Surface Water	Livestock Local Supply	1,077	1,077	1,077	1,077	1,077	1,077
Total Projected Water Supplies (acre-feet per year) =					9,903	9,685	9,474	9,269	9,070	8,878

Zavala

RWPG	WUG	River Basin	Source Type	Source Name	2000	2010	2020	2030	2040	2050
L	Batesville	Nueces	Groundwater	Carrizo-Wilcox Aquifer	589	589	589	589	589	589
L	Crystal City	Nueces	Groundwater	Carrizo-Wilcox Aquifer	3,887	3,887	3,887	3,887	3,887	3,887
L	La Pryor	Nueces	Groundwater	Carrizo-Wilcox Aquifer	839	839	839	839	839	839
L	County-Other	Nueces	Groundwater	Carrizo-Wilcox Aquifer	658	658	658	658	658	658
L	Irrigation	Nueces	Groundwater	Carrizo-Wilcox Aquifer	22,491	22,546	22,563	3,163	3,169	3,171
L	Livestock	Nueces	Surface Water	Livestock Local Supply	881	881	881	881	881	881
L	Manufacturing	Nueces	Groundwater	Carrizo-Wilcox Aquifer	1,914	1,914	1,914	1,914	1,914	1,914
L	Mining	Nueces	Groundwater	Carrizo-Wilcox Aquifer	97	42	25	8	2	0
Total Projected Water Supplies (acre-feet per year) =					31,357	31,356	31,356	11,939	11,939	11,939

Water Supply Needs and Management Strategies

The following table identifies from 2001 State Water Plan various strategies for Dimmit, La Salle, and Zavala Counties. The WGCD has considered the following management strategies and will periodically review them as the State Water Plan is updated.

Recommended Groundwater Management Strategies (Dimmit, La Salle, and Zavala Counties) – Table C

Dimmit

WPG	WUG	River Basin	Water Management Strategy	Source Name	Source Type	2000	2010	2020	2030	2040	2050
L	Big Wells	Nueces	Conservation – Municipal	Carrizo-Wilcox Aquifer	Groundwater	3	5	4	3	3	1
L	Carrizo Springs	Nueces	No Details	Carrizo-Wilcox Aquifer	Groundwater	500	1,000	1,000	2,500	3,000	3,500
L	Carrizo Springs	Nueces	Conservation – Municipal	Carrizo-Wilcox Aquifer	Groundwater	8	29	34	26	30	34
Total Recommended Water Management Strategies (acre-feet per year) -						511	1,034	1,038	2,529	3,033	3,535

La Salle											
RWPG	WUG	River Basin	Water Management Strategy	Source Name	Source Type	2000	2010	2020	2030	2040	2050
L	Cotulla	Nueces	Conservation – Municipal	Carrizo-Wilcox Aquifer	Groundwater	5	21	17	18	12	6
Total Recommended Water Management Strategies (acre-feet per year) =						5	21	17	18	12	6
Zavala											
RWPG	WUG	River Basin	Water Management Strategy	Source Name	Source Type	2000	2010	2020	2030	2040	2050
L	Crystal City	Nueces	Conservation – Municipal	Carrizo-Wilcox Aquifer	Groundwater	20	52	43	33	23	11
L	Irrigation	Nueces	Conservation - Irrigation	Carrizo-Wilcox Aquifer	Groundwater	6,401	6,401	6,401	6,401	6,401	6,401
L	La Pryor	Nueces	Conservation – Municipal	Carrizo-Wilcox Aquifer	Groundwater	3	7	5	4	3	2
Total Recommended Water Management Strategies (acre-feet per year) =						6,424	6,460	6,449	6,438	6,427	6,414

Historical Reported Groundwater Pumpage – Table D (TWDB Water Use Survey Database)

Dimmit County

Year	Aquifer	River Basin	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock	Total Pumpage
1980	Carrizo-Wilcox	Nueces	2,779	22	0	732	19,051	543	23,127
		Rio Grande	50	0	0	0	0	131	181
1984	Carrizo-Wilcox	Nueces	2,301	10	0	432	17,679	610	21,032
		Rio Grande	6	0	0	0	0	147	153
1985	Carrizo-Wilcox	Nueces	2,215	0	0	582	20,821	510	24,128
		Rio Grande	6	0	0	0	0	123	129
1986	Carrizo-Wilcox	Nueces	2,342	0	0	74	11,529	480	14,425
		Rio Grande	5	0	0	0	0	116	121
1987	Carrizo-Wilcox	Nueces	2,117	0	0	587	6,225	677	9,606
		Rio Grande	5	0	0	0	0	164	169
1988	Carrizo-Wilcox	Nueces	2,568	0	0	498	10,497	640	14,203
		Rio Grande	5	0	0	0	0	155	160
1989	Carrizo-Wilcox	Nueces	2,679	0	0	506	7,382	631	11,198
		Rio Grande	6	0	0	0	0	152	158
1990	Carrizo-Wilcox	Nueces	2,204	0	0	506	6,085	636	9,431
		Rio Grande	6	0	0	0	0	154	160
1991	Carrizo-Wilcox	Nueces	3,900	0	0	920	3,579	650	9,049
		Rio Grande	6	0	0	0	0	157	163
1992	Carrizo-Wilcox	Nueces	2,370	0	0	920	3,652	497	7,439
		Rio Grande	6	0	0	0	0	120	126
1993	Carrizo-Wilcox	Nueces	2,611	0	0	920	5,886	475	9,892
		Rio Grande	6	0	0	0	0	115	121
1994	Carrizo-Wilcox	Nueces	2,516	0	0	920	4,507	635	8,578
		Rio Grande	6	0	0	0	0	154	160
1995	Carrizo-Wilcox	Nueces	2,700	0	0	919	5,489	634	9,742
		Rio Grande	4	0	0	0	0	154	158
1996	Carrizo-Wilcox	Nueces	2,812	0	0	919	5,185	549	9,465
		Rio Grande	4	0	0	0	0	133	137
1997	Carrizo-Wilcox	Nueces	2,404	0	0	919	1,706	527	5,556
		Rio Grande	4	0	0	0	0	128	132
1998	Carrizo-	Nueces	2,484	0	0	919	1,786	323	5,512

	Wilcox	Rio Grande	4	0	0	0	0	78	82
1999	Carrizo-Wilcox	Nueces	2,541	0	0	919	1,792	356	5,608
		Rio Grande	4	0	0	0	0	86	90
2000	Carrizo-Wilcox	Nueces	3,130	0	0	919	3,793	356	8,198
		Rio Grande	5	0	0	0	0	86	91
2001	Carrizo-Wilcox	Nueces	2,381	0	0	917	5,230	476	9,004
		Rio Grande	4	0	0	0	0	115	119
2002	Carrizo-Wilcox	Nueces	2,120	0	0	917	7,015	385	10,437
		Rio Grande	3	0	0	0	0	93	96
2003	Carrizo-Wilcox	Nueces	2,207	0	0	917	4,305	352	7,781
		Rio Grande	3	0	0	0	0	85	88

La Salle County

Year	Aquifer	River Basin	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock	Total Pumpage
1980	Carrizo-Wilcox	Nueces	829	0	0	0	7,747	85	8,661
	Sparta		169	0	0	0	3,012	33	3,214
1984	Carrizo-Wilcox	Nueces	1,050	0	0	0	8,100	100	9,250
	Sparta		100	0	0	0	1,142	28	1,270
1985	Carrizo-Wilcox	Nueces	863	0	0	86	2,903	75	3,927
	Sparta		101	0	0	0	100	29	230
1986	Carrizo-Wilcox	Nueces	852	0	0	91	2,577	76	3,596
	Sparta		101	0	0	0	89	29	219
1987	Carrizo-Wilcox	Nueces	932	0	0	131	2,385	73	3,521
	Sparta		98	0	0	0	82	28	208
1988	Carrizo-Wilcox	Nueces	1,047	0	0	177	2,345	72	3,641
	Sparta		114	0	0	0	81	28	223
1989	Carrizo-Wilcox	Nueces	1,178	0	0	190	5,849	71	7,288
	Sparta		124	0	0	0	202	28	354
1990	Carrizo-Wilcox	Nueces	1,100	0	0	190	5,991	70	7,351
	Sparta		132	0	0	0	207	28	367
1991	Carrizo-Wilcox	Nueces	1,209	0	0	193	6,068	72	7,542
	Sparta		127	0	0	0	210	29	366
1992	Carrizo-Wilcox	Nueces	1,182	0	0	0	7,707	77	8,966
	Sparta		118	0	0	0	267	31	416
1993	Carrizo-Wilcox	Nueces	1,196	0	0	0	6,524	71	7,791
	Sparta		132	0	0	0	226	29	387
1994	Carrizo-Wilcox	Nueces	1,128	0	0	0	4,627	55	5,810
	Sparta		140	0	0	0	897	22	1,059
1995	Carrizo-Wilcox	Nueces	1,157	0	0	0	4,100	54	5,311

	Sparta		150	0	0	0	795	21	966
1996	Carrizo-Wilcox	Nueces	1,250	0	0	0	5,978	41	7,269
	Sparta		133	0	0	0	1,159	16	1,308
1997	Carrizo-Wilcox	Nueces	1,069	0	0	0	3,954	44	5,067
	Sparta		114	0	0	0	767	17	898
1998	Carrizo-Wilcox	Nueces	1,297	0	0	0	3,030	44	4,371
	Sparta		138	0	0	0	588	17	743
1999	Carrizo-Wilcox	Nueces	1,372	0	0	0	2,758	50	4,180
	Sparta		165	0	0	0	534	19	718
2000	Carrizo-Wilcox	Nueces	1,451	0	0	193	3,354	51	5,049
	Sparta		174	0	0	0	650	19	843
2001	Carrizo-Wilcox	Nueces	1,355	0	0	0	2,626	63	4,044
	Sparta		163	0	0	0	509	24	696
2002	Carrizo-Wilcox	Nueces	1,676	0	0	22	4,429	120	6,247
	Sparta		202	0	0	0	859	46	1,107
2003	Carrizo-Wilcox	Nueces	1,487	0	0	0	4,550	43	6,080
	Sparta		179	0	0	0	882	17	1,078

Zavala County

Year	Aquifer	River Basin	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock	Total Pumpage
1980	Carrizo-Wilcox	Nueces	2,147	974	0	68	81,800	397	85,386
1984	Carrizo-Wilcox	Nueces	2,617	1,065	0	135	90,673	129	94,619
1985	Carrizo-Wilcox	Nueces	2,199	905	0	143	94,200	113	97,560
1986	Carrizo-Wilcox	Nueces	2,412	880	0	0	39,865	92	43,249
1987	Carrizo-Wilcox	Nueces	2,423	835	0	127	34,968	83	38,436
1988	Carrizo-Wilcox	Nueces	2,686	891	0	124	74,621	69	78,391
1989	Carrizo-Wilcox	Nueces	2,611	1,214	0	116	92,370	68	96,379
1990	Carrizo-Wilcox	Nueces	2,362	1,293	0	116	76,296	71	80,138
1991	Carrizo-Wilcox	Nueces	2,492	1,083	0	114	70,894	73	74,656
1992	Carrizo-Wilcox	Nueces	2,313	1,261	0	114	58,125	88	61,901
1993	Carrizo-Wilcox	Nueces	2,520	1,037	0	114	51,085	89	54,845
1994	Carrizo-Wilcox	Nueces	2,583	722	0	114	54,095	96	57,610
1995	Carrizo-Wilcox	Nueces	2,577	688	0	114	55,914	92	59,385
1996	Carrizo-Wilcox	Nueces	2,701	710	0	114	56,062	81	59,668
1997	Carrizo-	Nueces	2,472	685	0	114	49,288	86	52,645

	Wilcox								
1998	Carrizo-Wilcox	Nueces	2,797	712	0	114	68,653	69	72,345
1999	Carrizo-Wilcox	Nueces	2,538	1,100	0	114	51,353	91	55,196
2000	Carrizo-Wilcox	Nueces	2,920	922	0	114	35,140	76	39,172
2001	Carrizo-Wilcox	Nueces	2,886	758	0	114	40,617	52	44,427
2002	Carrizo-Wilcox	Nueces	2,854	1,412	0	114	111,873	78	116,331
2003	Carrizo-Wilcox	Nueces	2,950	3,681	0	114	41,691	101	48,537

NOTES: All reported groundwater pumpage is in acre-feet.

Data source – TWDB Water Use Survey Database

8-Nov-05

Public Information

The District will take necessary steps to ensure the public is informed and will cooperate with the media and all interested parties. The dissemination of information to public is vital to create awareness and the public support that is needed to control and reduce the mining of the underground aquifer.

The District will also continue to pursue water conservation through a public information and education program. If used properly, voluntary conservation measures can significantly extend the life of the groundwater, thereby preventing the need for mandatory programs by this District or the State. Voluntary programs are entirely the function of providing the necessary education on conservation methods and habits along with the means to implement those methods. The District will continue to provide information to school districts and the public in an effort to create voluntary conservation.

Methodology the District Will Use to Track Progress on an Annual Basis in Achieving All Management Goals

The District Manager will prepare an annual report on District performances in achieving the management goals. The annual report will be presented to the Board of Directors during the first quarter of each calendar year. The report will include the number of instances each objective activity was engaged in during the year, referenced to the expenditure of staff time and budget so that the effectiveness and efficiency of each activity may be evaluated. The annual report will be maintained on file at the District Office and made available to the public upon adoption by the Board.

Goals and Objectives

Goal 1.0 Efficient Use of Ground Water.

Management Objectives: District will continue monitoring and recording data from the five (5) Carrizo Aquifer well/monitors.

Performance Standards: The District will assimilate data from the aquifer water level monitors and present to the Board monthly.

Goal 2.0 Controlling and Preventing Waste of Groundwater.

Management Objectives: The District will at least on two (2) occasions each year provide public information on water conservation and waste prevention through public speaking appearances at public schools, and civic organizations or newspaper articles.

Performance Standards:

- A. The number of speaking appearances made by the District each year.
- B. The number of newspaper articles published by the District each year.

Goal 3.0 Control and Prevent Subsidence. This management goal is not applicable to the District due to the fact that subsidence is not a problem identified in the District or region.

Goal 4.0 Address Conjunctive Surface Water Management Issues.

Management Objectives: Each year the District will confer at least on one occasion with the Nueces River Authority on cooperative opportunities for conjunctive resource management.

Performance Standard: The number of conferences on conjunctive resource management opportunities held with Nueces River Authority each year.

Goal 5.0 Address Natural Resource Issues that Impact the Use and Availability of Groundwater.

Management Objectives: Each year the District will insure that all new wells permitted for construction within the District, comply with the District construction standards through monitoring of the State of Texas water well report required to be provided to the District by water well drillers.

Performance Standard: The number of newly permitted water wells within the District monitored for compliance will be reported to the Board annually.

Goal 6.0 Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, Brush Control, Where Appropriate and Effective.

Management Objectives: The District, in partnership with the Texas A & M Research Center, Uvalde, Texas, will maintain and provide a Weather Station centrally located in the District.

Performance Standard: Hourly and average daily temperatures are available as a Precision Irrigation Network online at <http://uvalde.tamu.edu/pet/> to prescribe daily irrigated crops use/need for precipitation.

Management Objectives: The District will monitor existing recharge structure and evaluate how natural or artificial recharge may be increased for the groundwater resources within the District via the existing structure and/or new sites.

Performance Standard: The number of recharge sites monitored will be at least one site annually.

Performance Standard: The number of acre feet of captured rainwater in the recharge pit will be documented and reported to the Board of Directors annually.

Management Objectives: The District will participate in and manage the Southwest Texas Rain Enhancement Association cloud seeding project for eight months of each calendar year with five counties (Dimmit, La Salle, Uvalde, Webb, and Zavala Counties) in the target area. The project will be for precipitation increase and groundwater conservation. The project is also involved in hail suppression.

Performance Standard: The Southwest Texas Rain Enhancement Association annual report will be provided to the Board as well as anyone interested by January 31 of the following year. The day-to-day (each mission) reports are also available next day to the Board of Directors and any interested individual.

Management Objectives: Brush Control – Recharge Enhancement and Conservation Project in partnership with the Texas A & M Research Center, Uvalde, Texas, in La Salle County.

Performance Standard: Four (4) sites consisting of a control (no treatment – root plowed) freshly treated site – 5-year post treated, and 15-year post treated sites will be instrumented and data collected biweekly as to moisture depth and penetration and retention in relation to woody vegetation. Periodic updates will be forwarded to the Board of Directors and kept on file along with an annual report at the close of the project year. At the end of the project, data will be published in a scientific, peer-reviewed journal.

Goal 7.0 Drought Contingency Plan

Management Objectives: Each month the District will download the Palmer Drought Severity Index (PDSI) map and check the updates to the Drought Preparedness Council Situation Report posted on the Texas Water Information Network website www.txwin.net

Performance Standard: As required, the staff will assess the status of drought in the District and when needed, prepare a briefing with maps and situation reports for the Board of Directors. Monthly downloads will be filed for future use.

Goal 8.0 Desired Future Condition

Management Objectives: The District in conjunction with neighboring districts within our Groundwater Management Area will utilize the planning committee to develop the Desired Future Conditions of the aquifer.

Performance Standard: This goal is not applicable to the District at the time of plan adoption.

Regulation

The primary objective of this plan is to control groundwater withdrawals to reduce potential aquifer mining within the District. Groundwater withdrawals can be reduced through conservation of groundwater. In regulating groundwater withdrawals, the District shall take into account several factors, including:

- 1) economic impact of conservation measures;
- 2) the degree and effect of aquifer mining in the area; and
- 3) differing hydrological characteristics of the aquifer(s) within the District.

The District will utilize the data and information obtained to evaluate the effectiveness of its regulatory policies and determine what future action may be needed to achieve the mandate of the Act, the District Rules, and the objectives and requirements of this Plan.

Permits and Enforcement

The District may deny permits or limit groundwater withdrawals following the guidelines stated in the Act, Rules of the District, and this Plan, in determining whether to issue a permit or limit groundwater withdrawal, the District will weigh the public benefit against individual hardship after considering all appropriate testimony and all relevant factors that include:

- 1) the purpose of the District Rules;
- 2) the objectives and requirements of this Plan;
- 3) the economic impact on the applicant from grant or denial of the permit or terms prescribed by the permit; and
- 4) an equitable distribution of available groundwater.

In carrying out its purpose, the District is empowered to require the reduction of groundwater withdrawal to amounts that will reduce aquifer mining, and restore and maintain sufficient artesian pressure. To achieve this requirement, the District may, on its own initiative and based on information obtained through its monitoring procedures, amend or revoke any permits.

The District will enforce permit terms and conditions.

Equity and Discretion

The District recognizes that the burden of reducing the mining of an underground aquifer should be borne by all users of groundwater. Although a single entity's groundwater withdrawal may not be capable of causing severe problems, the total action by all users can cause significant mining of groundwater. Therefore, every entity must be regulated.

To achieve the objective, the District must use discretion in permitting groundwater withdrawals. Therefore, temporary exceptions to the general rule for a specific area may be necessary if an economic hardship will be created that is significantly greater for one person than for others in the District, or if required due to hydrological, physical, or geophysical characteristics.

The District Rules prescribe a production ratio of groundwater withdrawal based upon the number of acres of land owned by a property owner. Nothing in this Plan or the District Rules, however, should be interpreted to mean that a person is entitled to use groundwater in any amount merely because the District Rules prescribe a ratio for production. All uses of groundwater will be evaluated under the standards of beneficial use as defined in the District Rules and Chapter 36, Texas Water Code. The number of acres of land that are not within the Certificate of Convenience and Necessity (CCN) of a public or private water utility may be taken into consideration to meet the production ratio. If the well will be used to serve the connections within the boundaries of a water utility's CCN, then the utility's number of connections within the CCN justifies the amount of water requested. Commercial uses of water will be based upon beneficial standards.

Cooperation and Coordination

The District will work with the public, the regulated community, and state and local governments to achieve the District goals. The District will work with all water suppliers, industrial, and agricultural users to help them to preserve groundwater. The Texas Commission on Environmental Quality is the agency charged with protecting the state's water resources, and the Texas Water Development Board is the agency responsible for water resources planning and promotion of water conservation practices. The District will continue to work with both of these agencies throughout the life of this Plan.

Regulatory Action Plan

This portion of the Plan translates the legislative mandate of the District, Chapter 36 of the Texas Water Code and the policy and purpose of the District Rules into specific objectives and requirements. The Regulatory Action Plan establishes the requirements necessary to receive a water well drilling and production permit. The requirements are written as general guidelines, and each permit will be evaluated based on the best scientific data available. The current demand on the aquifer and the trend of the water levels in the area may be determining factors in the evaluation of a permit application.

Transportation of Water from the District

For conserving and protecting groundwater in the District, transportation of water from the District requires a permit as stated in the District Rules. In the review of applications for water transportation projects the District will take into account 1) the availability of water in the district and in the proposed receiving area during the period for which the water supply is requested; 2) the projected effect of the proposed transfer on aquifer conditions, depletion, subsidence, or effects on existing permit holders or other groundwater users within the district; and 3) the approved Regional Water Plan and this Plan. In addition to the foregoing, applications for

permits to authorize the transportation of water from the District are subject to all other well permitting and operating provisions required for any other well in the District, including well spacing, production limits, and authorized use of water under standards of beneficial use. Transportation permits will also be subject to an export fee established in the District's Rules and consistent with Chapter 36, Texas Water Code. Transportation permits shall be reviewable, in accordance with the District Rules, upon the submission or discovery of data that demonstrates that the export of such water is causing or contributing to a depletion or mining of the aquifers within the District or otherwise contradicts the policies established in the District Plan.

Groundwater Protection

Section 26.401 of the Texas Water Code states that: "In order to safeguard present and future groundwater supplies, usable and potential usable groundwater must be protected and maintained."

A change in more than 10 % in the average groundwater level of the wells monitored by the District and/or by TWDB will necessitate a change in pumpage in that area and will trigger a review of well permits issued by the District in the area in which the change is occurring.

Groundwater contamination may result from many sources, including current and past oil and gas production, agriculture activities, industrial and manufacturing processes, commercial and business endeavors, domestic activities, and natural sources that may be influenced or may result from human activities.

The District shall take appropriate measures to discontinue activities that are either causing, or are a potential threat to cause groundwater contamination. Due to permeability of aquifer outcrops and recharge zones, there is a greater threat for groundwater contamination from surface pollution in recharge and outcrop regions, and the District will impose more stringent restrictions on those areas.

Fees

Copies of the District Rules and Management Plan are \$5.00.

Water Well Drilling Permit Fee is \$175.00 of which \$75.00 is refundable to the applicant upon receipt of the drillers log and well registration to the District.

Water Well Production Permit Fee is \$25.00

Well Registration Fee for exempt wells is \$10.00.

Transportation Permit Application Fee is \$200.00.

Photocopies of District Documents are \$.10 per page.

Sending or receiving Facsimiles is \$2.00 for first page and \$1.00 thereafter including coversheet.

Document research by a District Employee is \$15.00 hr.

The cost of postage will be added when applicable.

Definitions

"Act" means the legislative Act that created the District that governs its operations.
(Act of H.B. 3602, 75th Legislature.)

"Area" means a geographical area designated by the Board in which regulatory policy will be applied.

"Board" means the Board of Directors of the Wintergarden Groundwater Conservation District.

"Certificate of Convenience and Necessity (CNN)" means the designation of geographical boundaries of a service area of a water utility.

"District" means the Wintergarden Groundwater Conservation District.

"Groundwater" means water located beneath the earth's surface but does not include water produced with oil in the production of oil and gas.

"Mining of an Aquifer or Aquifer Mining" means to extract groundwater from an aquifer at an annual rate which exceeds the normal recharge to the aquifer.

"Outcrop" means an area which an underground stratum or geologic formation is found at the surface of the ground.

"Person" includes corporation, individual, organization, government or governmental subdivision or agency, business trust, estate trust, partnership, association, or any other legal entity.

"Plan" means this District Water Management Plan.

"Water Utility" means any corporation, company, entity, or governmental subdivision public or private that sells water to any person within its service area.

"Well" means any excavation, facility, device, or method that could be used to withdraw groundwater.

"Withdraw" means the act of extracting groundwater by any method.

Table 2. Groundwater flow budget for each aquifer layer, into and out of, Dimmit, La Salle, and Zavala counties, in the steady-state GAM of the southern part of the Queen City and Sparta aquifers. Flows are in acre-feet per year.

Aquifer Layer	Lateral Flow		Top of Aquifer		Bottom of Aquifer		Recharge	ET	Stream Leakage	
	Into GCD	Out of GCD	Downward Leakage	Upward Leakage	Upward Leakage	Downward Leakage			From Streams	To Streams
Sparta (1)	2,694	-979	3,011	-17,579	-12,615	-5,139	9,417	-1,019	504	-3,515
Queen City (3)	6,654	-3,527	5,504	-12,486	15,773	-2,352	21,829	-1,373	3,750	-33,741
Carrizo (5)	9,341	-9,292	2,175	-14,764	8,079	-4,329	12,166	-459	1,251	-4,094
Upper Wilcox (6)	2,125	-1,833	4,329	-8,079	4,980	-1,347	663	-156	0	-656
Middle Wilcox (7)	1,392	-1,243	1,347	-4,980	4,118	-1,234	1,412	-55	463	-1,204
Lower Wilcox (8)	4,812	-3,112	1,234	-4,118	0	0	1,142	-26	345	-282
Total ¹	27,018	-19,986	17,600	-62,006	45,565	-14,401	46,629	-3,088	6,313	-43,492

Note: a negative sign refers to flow out of the aquifer in the GCD. A positive sign refers to flow into the aquifer in the GCD. All numbers are rounded to the nearest 1 acre-foot and are probably only accurate to two significant figures.

¹ The total flows are slightly less than those listed in Table 1 of the original GAM 05-28 report because flows for layers 2 and 4 are not included in this table. Layers 2 and 4 are aquitards.