UNITED STATES DISTRICT COURT WESTERN DISTRICT OF TEXAS
Lucius D. Bunton, Senior Judge

Todd H. Votteler, Special Master
Sierra Club v. San Antonio, et. al.

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1996

EMERGENCY WITHDRAWAL REDUCTION PLAN

for the Edwards Aquifer

Sierra Club v. San Antonio et al

Case No. MO-96-CA-097

The U.S. District Court, Western District of Texas

Midland-Odessa Division

The Honorable Lucius Bunton, Presiding

August 23, 1996

NOTE: "Definitions of Words, Phrases and Acronyms" used herein appear in the last section.

Introduction

The Edwards Aquifer region has finally reached the point where the Aquifer is unable to provide for the needs of all those who depend upon it during dry years, both those over the Aquifer and those on the Guadalupe River downstream of Comal and San Marcos Springs. Without a fundamental change in the value the region places on fresh water, a major effort to conserve and reuse Aquifer water, and implemented plans to import supplemental supplies of water, the region's quality of life and economic future is imperiled.

The Edwards Aquifer can no longer adequately provide for the needs of all those who depend upon it in years of high withdrawals and low recharge to the Aquifer. As a consequence some uses of Edwards Aquifer water must be given priority over other uses. Using Aquifer water for lawns and landscaping is of lower priority than the use of water for human consumption, health, and safety.

The longer the region delays conservation and reuse of Edwards Aquifer water and the development of water supplies to supplement it's dependence on the Edwards Aquifer, the scarcer supplemental supplies will become and the higher their cost will be.

Comparison of low Comal Springs flows during the last 20 years confirm beyond a reasonable doubt that flows in August 1996 are at a critical level making evidence of an emergency obvious to any reasonable individual. (see Figures 1 and 2) In each of the last two years and to this date in 1996, Comal Springs are generally lower on any given day in each succeeding year. No one knows when rainfall will overcome the current deficits and raise the Aquifer to normal or average levels. It is wiser for the health,

safety, welfare and economic well-being of the people of the region to act now as though next year's rainfall is likely to be equal to, or less than, rainfall in 1996 - until there is conclusive evidence to the contrary. Critical years of low springflows and high withdrawals are occurring at shorter intervals with increasing severity. Unless the region can alleviate the consequences of constantly higher annual withdrawals in excess of average annual recharge from rainfall, the inevitable result will be that Comal and San Marcos Springs will go dry or flow only intermittently, as have all other major springs originally flowing from the Edwards Aquifer.

The most critical risks lie ahead. In the year following each of the last three years, 1993, 1994 and 1995, annual recharge to the Edwards Aquifer has not replaced the preceding year's total discharge (withdrawals plus springflows, including discharges at Comal and San Marcos Springs). According to the U.S. Geological Survey, average recharge to the Edwards since 1934 has been 674,200 acre-feet per year. Recharge in 1993 was 447,600 acre-feet; in 1994 it was 536,100 acre-feet; in 1995, 531,300 acre-feet. Since October 1995, recharge has been essentially flat. Thus, withdrawals in 1994, 1995 and 1996, are coming from storage in the Edwards. While rainfall cannot be predicted with certainty, there is growing concern that there will be no significant relief from the drought in 1997. Under these circumstances, groundwater pumped from the Edwards during the remainder of 1996 could create an even more serious shortage of springflows in 1997. Prudence dictates that discretionary withdrawals be reduced now until there is significant recharge.

Figure 1.

Comal Springs 1984, 1989, 1990

Years With Rapid Springflows Declines

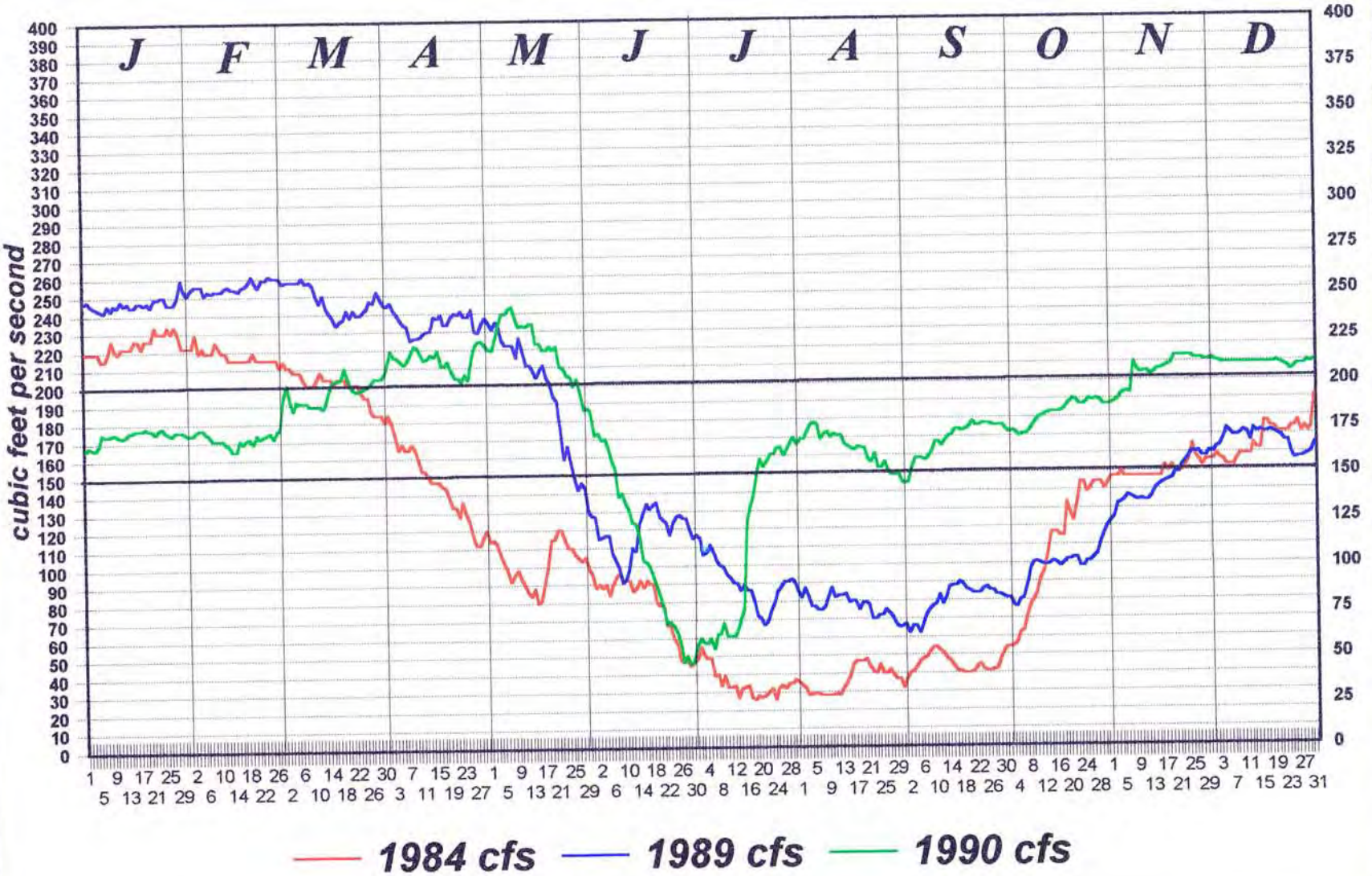
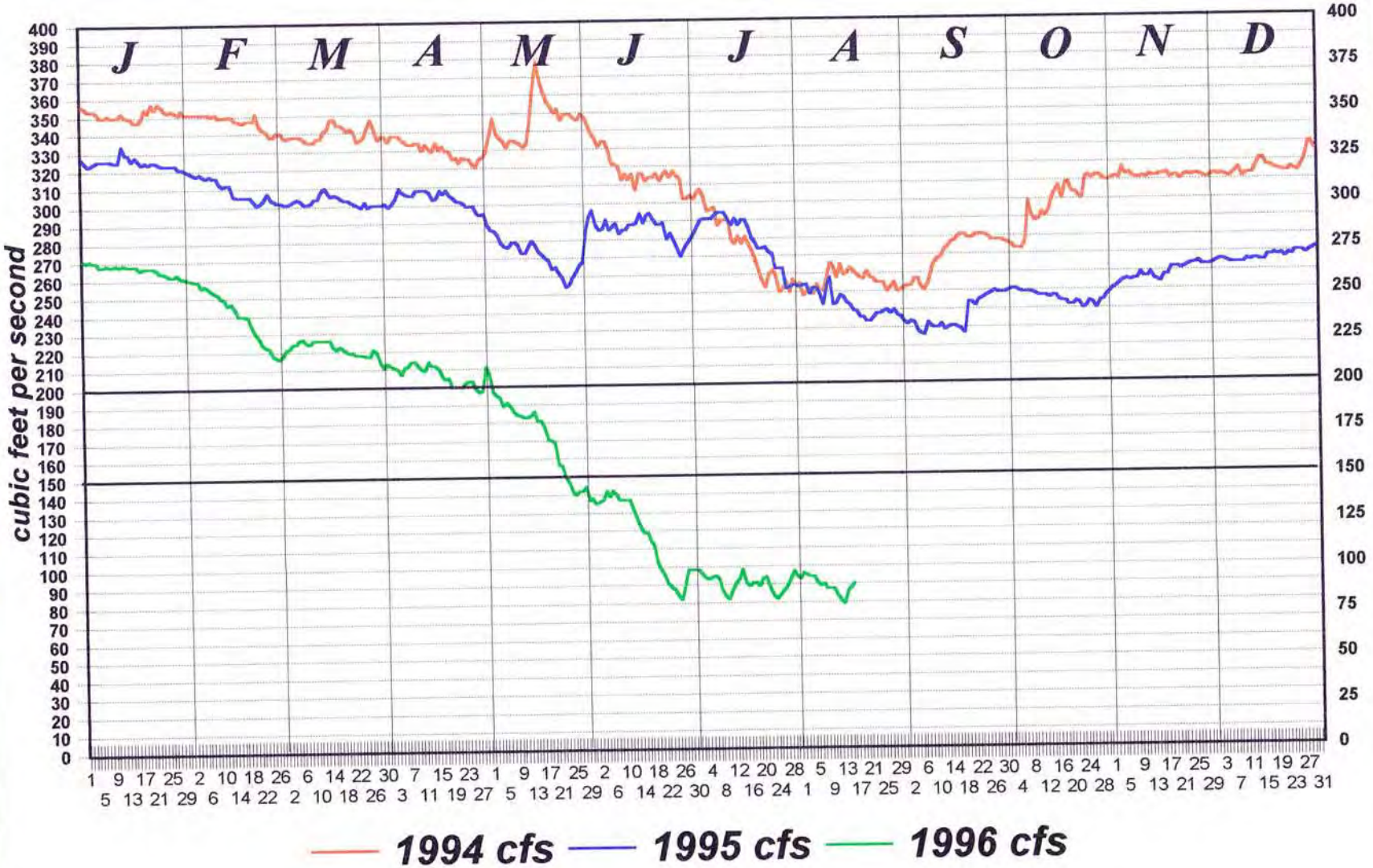


Figure 2.

Comal Springs 1994,1995,1996

Years of Declining Springflows



The Endangered Species Act (ESA) requires preservation of species in their natural habitat rather than their indefinite preservation in refuges, which are regarded only as a management means during critical periods to assure their survival. Section 2(b) of the Endangered Species Act states:

> "The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section." (emphasis added)

In this instance the natural habitat required to be preserved is the underground Aquifer or flow from the spring openings themselves and immediately downstream. Ignoring federal statutory mandates at the center of this litigation is not an option available to this Court.

In the preamble of the Guadalupe-Blanco River Authority's *Proposed Emergency Rules of the Edwards Aquifer Authority*, the severity of the current crisis is described in detail:

> ". . . . Massive unregulated pumping from the Edwards (Balcones Fault Zone) Aquifer, San Antonio Region (the "Aquifer") is causing an imminent threat of severe and irreparable harm to the water in the Aquifer, the Comal and San Marcos Springs, the receiving surface streams and bay and estuaries, and the unique species that live underground in the Aquifer and at and downstream of the Springs. The Aquifer is threatened as a source of water supply for millions of people, both those who use water pumped from the Aquifer, and those who hold surface water rights to divert water downstream of the springs and, therefore, rely

on springflows for their water supply.

> "Conditions are extremely dry in the Aquifer region, and Aquifer levels, springflows, and downstream river flows continue to drop at alarming rates. Springflows on July 30, 1996, . . . , were [93] cfs at Comal Springs and [80] cfs at San Marcos Springs. These springflows are well below not only the "take" levels established by the U.S. Fish and Wildlife Service, but also the "jeopardy" levels (levels below which the continued existence of listed species is jeopardized). Springflows today are almost at the levels in 1984 at which significant water-quality impacts (e.g., significant increases in pH of the water in the Aquifer and exiting the Springs, from the normal level of approximately 7.2 to over 9.0) began to be detected. There is no reason to believe that the same or similar impacts will not occur this year, if Aquifer levels are allowed to continue to drop further. The natural flow of the Guadalupe River at Victoria today is about 7% of the monthly norm, and diversions by downstream water rights holders are now being curtailed. There is virtually no flow from the Guadalupe River into San Antonio Bay today.
>
> ". . . Adoption of these rules on an emergency basis is needed to reduce pumping to the extent necessary to maintain adequate levels of fresh water in the Aquifer at all times to: (1) avoid contamination of fresh water by intrusion into the fresh water of bad-quality water located immediately adjacent to the fresh water, or by any other mechanism caused or allowed by lowered fresh-water levels; (2) avoid contamination of the receiving surface streams by the discharge of the contaminated water from the

Springs; (3) provide adequate and continuous flows of uncontaminated fresh water from the Springs to protect the water quality and fish and wildlife habitats in the receiving surface streams and San Antonio Bay and Estuary; (4) provide adequate and continuous flows of uncontaminated fresh water from the Springs to protect the endangered and threatened species that live underground in the Aquifer and at and downstream of the Springs; (5) provide adequate and continuous flows of uncontaminated fresh water from the Springs to satisfy needs under downstream surface water rights; and (6) avoid violations under state and federal laws, including the Safe Drinking Water Act, the Clean Water Act, and the Endangered Species Act."

(Guadalupe-Blanco River Authority, *Proposed Emergency Rules of the Edwards Aquifer Authority*, July 25, 1996, p. 1.)

State Law Mandates Implementation of a Critical Period Management Plan

Through Senate Bill 1477, the Legislature created the Edwards Aquifer Authority (EAA). S.B. 1477 requires the EAA to prepare and implement a critical period management plan with goals similar to this Plan. S.B. 1477 states:

"SECTION 1.26. CRITICAL PERIOD MANAGEMENT PLAN. The authority shall prepare and coordinate implementation of a plan for critical period management on or before September 1, 1995. The mechanisms must:

(1) distinguish between discretionary use and non-discretionary use;

(2) require reductions of all discretionary use to the maximum extent feasible;

(3) require utility pricing, to the maximum extent feasible, to limit discretionary use by the customers of water utilities; and

(4) require reduction of non-discretionary use by permitted or contractual users, to the extent further reductions are necessary, in the reverse order of the following water use preferences:

(A) municipal, domestic, and livestock;

(B) industrial and crop irrigation;

(C) residential landscape irrigation;

(D) recreational and pleasure; and

(E) other uses that are authorized by law."

(S.B. 1477, Section 1.26)

Through S.B. 1477, the State has clearly established the priority of water uses for those who rely on Edwards Aquifer groundwater.

S.B. 1477 also states:

"To accomplish the purposes of this article, by June 1, 1994, the authority, through a program, shall implement and enforce water management practices, procedures, and methods to ensure that, not later than December 31, 2012, the continuous minimum springflows of the Comal Springs and the San Marcos Springs are maintained to protect endangered and threatened species to the extent required by federal law. . . " (S.B. 1477, Section 1.14 (h))

This provision clearly establishes the State's intent to maintain springflow a Comal and San Marcos Springs.

On February 14, 1996, the U.S. Fish and Wildlife Service approved the "San Marcos and Comal Springs and Associated Aquatic Ecosystems (Revised) Recovery Plan" (Recovery

Plan) for the Edwards Species. The Recovery Plan states:

> "The resolution of the problem of maintaining springflows needed for these species to survive is so critical that, in the absence of a regional Aquifer Management Plan enforced by state and local governments, the Service should be prepared to initiate legal action required to maintain springflows at levels that would maintain habitat sufficient to prevent jeopardy to listed species." (Recovery Plan, p. 3)

No regional plan for managing the Edwards Aquifer is currently in effect. Present springflow levels at Comal and San Marcos Springs are below the established jeopardy levels and the U.S. Fish and Wildlife Service (USFWS) has not initiated any legal action to protect endangered species at the Springs.

Edwards Aquifer Water Use

Municipal Water Use

Pumping of Edwards Aquifer groundwater for municipal uses in the five years of highest pumping since 1980--1984, 1985, 1988, 1989 and 1990 -- accounts for more than 50% of all withdrawals (see Table 1). In three of these years 1984, 1989 and 1990, Comal Springs flows dropped to 60 cfs or lower (see Figure 1). Of all water purveyors, SAWS supplying water to citizens of San Antonio, accounts for approximately two-thirds of all municipal pumping. Thus, Comal Springs flows can be maintained only if there is adequate consistent compliance with the restrictions in this Plan by SAWS customers.

Table 1. Five Years of Highest Pumping from the Edwards Aquifer 1980-1995

Water Use	1984		1985		1988		1989		1990	
	1,000 acft.	%	1,000 acft.	%	1,000 acft.	%	1,000 acft.	%	1,000 acft.	%
Municipal	287.2	54.2	263.7	50.5	286.2	53.0	285.2	52.6	254.9	52.1
Irrigation	191.2	36.1	203.1	38.9	193.1	35.7	196.2	36.2	172.9	35.3
Industrial	15.2	2.9	16.5	3.1	18.8	3.5	22.9	4.2	23.7	4.8
Domestic and Livestock, etc.	36.2	6.8	39.2	7.5	41.9	7.8	38.2	7.0	37.9	7.8
Total	529.8	100.0	522.5	100.0	540.0*	100.0	542.5	100.0	489.4	100.0

*Subtotal slightly different due to rounding.

acft. = acre feet. One acre foot is 325,851 gallons.

Source: U.S. Geological Survey, July 12, 1994.

Irrigation Water Use in 1997

There is little evidence that use of the most modern and efficient irrigation practices and equipment, such as drip irrigation and efficient nozzle applicators to reduce evaporation, are being widely used by irrigators in Bexar, Medina and Uvalde Counties, the Counties that account for the vast majority of irrigation withdrawals from the Aquifer. Table 1 clearly demonstrates that during the five years of highest pumping from the Aquifer since 1980, withdrawals for irrigation use have averaged about 35% of total pumping. The total withdrawals of municipal and irrigation uses account for approximately 90% of the total annual withdrawals from the Aquifer during the five years of highest pumping since 1980. Because much pumping for irrigated agriculture appears to occur before the period of peak municipal withdrawals from the Aquifer, reductions in irrigation withdrawals should be implemented at the beginning of those years when it appears that factors such as low springflow at Comal Springs, high withdrawals, and low recharge in the preceding year, foreshadow low springflows at Comal and San Marcos Springs in the coming year. Such factors were developed for the Court in the *Revised Emergency Withdrawal Reduction Plan* in March 1995, and in the *Take and Jeopardy Early Warning Indicators* chart filed with the Court in October 1995. Unless there is significant recharge in the remaining months of 1996, plans for restricting irrigation water use in 1997 should be ready by January 1, 1997, at the latest.

One possible solution is activation of the so called "dry year option", under which irrigation farmers would be compensated for their lost profits when irrigated production is curtailed to assure springflow. SAWS and Bexar Met, or other waters and agencies, should take the lead, in consultation with the Edwards Aquifer Authority, to develop such an option before January 1, 1997. Income from drought surcharges imposed this year by purveyors can be used to purchase the necessary options from irrigators. Credit for reductions in irrigation water use, in the form of additional withdrawals, could be given by the Court in future plans to those funding the "dry year option".

Progress in Developing Alternative Surface Water Supplies for the Edwards Aquifer Region

The City of New Braunfels has a surface water permit for 6,720 acre-feet per year from the Canyon Reservoir to be taken from the Guadalupe River, plus an additional 2,240 acre-feet per year because of the termination of cooling water withdrawals for the closed Lower Colorado River Authority steam electric power plant at Landa Lake for a total of 8,960 acre-feet per year. The cost of this water, treated and delivered to a customer is $0.64 per 1,000 gallons (without a subsidy that was provided by the Edwards Underground Water District for five years). Pumping Edwards Aquifer groundwater occurs only when demand exceeds the capacity of the New Braunfels Utilities (NBU) water treatment plant. The Court believes the citizens of New Braunfels should not be penalized with additional water use restrictions, but is of the opinion they should adopt and enforce conservation measures as recommended for other water purveyors in the Guadalupe River Basin. Therefore, New Braunfels should restrict its pumping from the Aquifer at or below its July 1996 total.

The City of San Marcos has a permit for 5,000 acre-feet per year from Canyon Lake. In April 1996, the City entered into an agreement with the GBRA for a regional project to supply treated water to the City and adjacent water utilities through a diversion and transmission facilities from Lake Dunlap.

The constructive actions taken by New Braunfels and San Marcos demonstrate that water purveyors with the will to do so can lead their customers to make the costly shift from Edwards Aquifer groundwater to treated surface water.

In April 1995, the San Antonio Water System (SAWS), GBRA, Bexar Metropolitan Water District (Bexar Met), San Antonio River Authority (SARA), NBU, and Canyon Regional Water Authority (CRWA) executed a Letter of Intent to develop a regional plan to

transport and treat as much as 15,000 acre-feet per year of Guadalupe River surface water for use by water purveyors in the eastern Edwards Aquifer region, by cities along the I-35 corridor and by military bases in Bexar County. A pre-condition to final consummation of any contractual arrangements, an effective system for regulating pumping from the Aquifer, is now underway by the EAA. Negotiations among the signatories to the Letter of Intent have resumed. The CRWA and GBRA are developing a contract to supply and treat as much as 5,000 acre-feet per year of stored water from Canyon Reservoir for water purveyors in the mid-cities area. Also GBRA and the Canyon Lake Water Supply Corporation are developing a contract to provide treated surface water in the area of the Lake and northern Bexar County. All parties are urged to pursue these projects with all deliberate speed so as to further reduce pumping from the Edwards Aquifer.

Bexar Met is designing a 9 mgd (some 10,000 acft. annually) water treatment plant to provide potable (treated) water to military bases and other customers in southwest Bexar County. This project may achieve the first introduction of a significant quantity of treated surface water to the Edwards Aquifer region since litigation over water use from the Aquifer began.

Water Reuse

This *Plan* places no limitation upon the use or distribution within the Edwards Aquifer region of reuse water or water that is not withdrawn from the Edwards Aquifer.

The San Antonio River Authority presently has under construction a flood control tunnel to divert flood flows around the downtown river walk. Completion is scheduled in mid 1998. In conjunction with this tunnel, SAWS is presently designing the Central East Project to supply 16,000 acre-feet annually of treated wastewater for use as river walk flow in the San Antonio River (50%) and to supply irrigation water for a golf course and a cemetery (50%). In addition, engineers have been employed by SAWS to prepare plans

for the Leon Creek Water Reuse Project to supply as much as 18,000 acre-feet of treated wastewater to military bases and industries on the western side of San Antonio. Treated wastewater for these two projects will be supplied from the Leon Creek treatment plant and either the Salado or Dos Rios treatment plants. This project is scheduled for completion in 1999. Thus as much as 34,000 acre-feet of treated wastewater can be substituted for Edwards Aquifer withdrawals after 1999.

Military Water Use

Currently, military pumping of Edwards Aquifer groundwater for military bases represents about 3% of total withdrawals (included within municipal water use totals). Of that 3%, Kelly Air Force Base accounts for about 1%. The military installations in Bexar County are expected to abide by the restrictions imposed on lawns, parks, parkways, golf courses and other landscaped areas, which are described in the Water Use Reductions section.

Since March 1995, the military bases have been seeking alternative surface water supplies to meet 40% of their estimated annual requirements as follows:

	Acre Feet	
	Reuse	Potable
Brook Air Force Base (currently supplied by SAWS)	94	210
Fort Sam Houston	960	736
Lackland and Kelly Air Force Bases	1,136	1,737
Randolph Air Force Base	0	690

This demonstrates that the military bases expect to reduce their current groundwater withdrawals by 40%.

The attached correspondence reflects on-going negotiations between SAWS, Bexar Met and the military bases (1) for potable (treated) water from a 9 mgd treatment plant (some 10,000 acft. annually) using Medina River water to be constructed by Bexar Met beginning this year and (2) for reuse water (treated wastewater) from SAWS through a project now being designed. Also attached is a graph showing how Edwards Aquifer groundwater withdrawals have declined at Kelly Air Force Base since 1984; similar declines have been documented for other military bases.

Water Use Reductions

The Court adopts the staged reductions and their maximum allowable peak-to-base pumping ratio requirements for municipal use, developed in June 1995, by representatives of the Edwards Underground Water District, the City of San Antonio, the Green Valley Special Utility District and Atascosa Rural Water Supply Corporation, the City of New Braunfels and New Braunfels Utilities, and Danny McFadin, et al. These staged reductions and pumping requirements are found in the compromise emergency withdrawal reduction plan (CEWRP) otherwise known as the *Lawyers Panel Plan* (see Table 2).

The municipal reductions in Table 2 apply only to water withdrawn from the Edwards Aquifer, and do not apply to reuse water or water that is not withdrawn from the Edwards Aquifer. Some entities including New Braunfels Utilities, East Central Water Supply Corporation, Crystal Clear Water Supply Corporation, and Green Valley Special Utility District already supplement their use of Edwards Aquifer water with substantial amounts of surface water, and Bexar Met and San Marcos are rapidly developing facilities for delivery of treated surface water to their customers.

Table 2. Trigger Levels and Targeted Municipal Reductions

WATER LEVEL WELL J-17	SPRINGFLOW	REDUCTION STAGE	PEAK REDUCTION PERCENTAGE TARGET	MAXIMUM ALLOWABLE PEAK-TO-BASE PUMPING RATIO
>655 ft msl	>260 cfs	none	none	full
655 and less	260 cfs	I	10%	1.8 x base
648 and less	200 cfs	II	20%	1.6 x base
642 and less	175 cfs	III	40%	1.2 x base

NOTES:
(1) Reduction stages will terminate when J-17 levels have been above the trigger level by five feet or more for seven days.
(2) Base usage is indexed to the monthly winter usage, i.e., average of the three lowest months of November, December, January, and February. Total elimination of discretionary use would drop the Peak-To-Base Pumping Ratio to 1.0.

Source: (Lawyers) *Panel Report*, filed with the Court June 2, 1995, p. 4.

Municipal reductions will cease when J-17 levels have been above the trigger level

by five feet or more for seven days.

Conditional Exemptions

New Braunfels Utilities

New Braunfels Utilities has converted almost entirely to surface water. NBU's winter average water use from the Edwards Aquifer is essentially zero. The Court believes that the NBU should not be subject to the additional water use restrictions listed in Table 2, but is of the opinion they should adopt and enforce conservation measures as recommended for other water purveyors in the Guadalupe River Basin. Therefore, New Braunfels should restrict its pumping from the Aquifer at or below its July 1996 total.

Industrial, Commercial, and Military Pumpers

Industrial, commercial, and military pumpers should freeze their withdrawals at or below their July 1996 totals. Industrial, commercial, and military pumpers qualifying for this exemption must accept this Plan and agree to provide the Court with weekly reports of their total withdrawals from the Edwards Aquifer.

In the event that industrial, commercial, or military water use increases, or that municipal pumpers are unable to reach their maximum allowable peak-to-base pumping ratio requirements of this Plan under the current reduction stage, additional reductions in Edwards Aquifer pumping can be made only by eliminating all discretionary uses and imposing further restrictions on industrial, commercial, and military water use.

Non-discretionary water uses from the Edwards Aquifer essential to the mission of any military installation are not intended to be restricted by any required reductions in this

Plan. As federal defendants, the military bases are expected to appoint a representative to report to the Court through the Special Master monthly on the progress of negotiations for contracting for potable or reuse water as a substitute for the Edwards Aquifer groundwater. The Court urges the military to pursue these projects with all deliberate speed and to execute contracts for substitute sources of water on or before December 31, 1996, so as to further reduce pumping from the Edwards Aquifer. The failure of military bases to execute contracts for substitute sources of water on or before December 31, 1996, could require the Court to initiate additional measures on January 1, 1997.

Water Use Less than 120 gpcd

Where a water purveyor distributing only Edwards Aquifer water to its customers can demonstrate to the Court through the Special Master that an identifiable, discreet portion of its service area, based on reports to the Texas Water Development Board, has a gallon per capita per day water usage from the Edwards Aquifer of less than a 120 gpcd, that discreet portion shall be exempt from reductions in discretionary water use in this *Plan*, except for car washing and Stage III reductions for watering of golf courses, lawns, parks, parkways, and other landscaped areas.

Alternative Water Use Restrictions

The Court has developed alternative restrictions, with the help of comments from defendants and members of the public, that defendants may consider in achieving the reductions contained in Table 2, but which are not mandatory. For the purposes of this these alternative restrictions **discretionary water use** is defined as:

> Those beneficial uses of water which are not essential to the protection of public health and safety. Examples are lawn watering, watering of ornamental and recreational landscaping, operation of non-recirculating ornamental fountains and

water features, water used for recreational or aesthetic purposes, street and automobile washing (except to eliminate a health or safety hazard). Discretionary water use does not include water essential to an industrial or manufacturing production process or commercial activity upon which gainful employment is dependent. Generally, water use in excess of winter average water use. Irrigation water use is not a discretionary water use.

1. Foundations. The following restrictions do not apply to the use of reuse water or water that is not withdrawn from the Edwards Aquifer. The application of water to protect foundations is permitted in all Stages described in Table 2, using hand-held hoses (with or without water breakers), drip irrigation, or buckets of five gallons or less, and then only before 8:00 a.m. and after 8:00 p.m.

2. Swimming Pools. The following restrictions do not apply to the use of water that is not withdrawn from the Edwards Aquifer. For the purposes of this *Plan* new swimming pools are those where installation commences after the date this *Plan* is ordered.

Stage I:

There are no restrictions on the filling or refilling of existing, or new single family swimming pools;

Stage II:

(a) There are no restrictions on the filling or refilling of existing single family swimming pools that use a device or cover that conserves water by reducing evaporation when the pool is not in use.

(b) The use of Edwards Aquifer groundwater is prohibited for the filling or

maintenance of all new swimming pools, however water that is not withdrawn from the Edwards Aquifer may be used; and

Stage III:

(a) The use of Edwards Aquifer groundwater is prohibited for the filling or refilling of existing single family swimming pools that do not use a device or cover that conserves water by reducing evaporation when the pool is not in use.

(b) The use of Edwards Aquifer groundwater is prohibited for the filling or maintenance of all new swimming pools; however, water that is not withdrawn from the Edwards Aquifer may be used.

3. Lawns, Parks, Parkways, and Other Landscaped Areas. The Edwards Aquifer region must begin the transition from landscaping with ground covers such as St. Augustine grass that require large quantities of water to drought tolerant ground covers such as buffalo and bermuda grasses that use less water and become dormant under drought conditions. The following restrictions do not apply to the application of reuse water or water that is not withdrawn from the Edwards Aquifer. For the purposes of this *Plan* new lawns, parks, parkways, and other landscaped areas are those where installation commences after the date this *Plan* is ordered.

Stage I:

(a) The use of Edwards Aquifer groundwater for watering of existing lawns, parks, parkways, and other landscaped areas will be allowed only for a total of thirty minutes using sprinklers or sprinkler systems on Tuesday and Saturday before 8:00 a.m. and after 8:00 p.m., or daily by using hand-held hoses (with or without water breakers), drip irrigation, or buckets of five gallons or less, and then only before 8:00 a.m. and after 8:00 p.m.

(b) The use of Edwards Aquifer groundwater is prohibited for the watering of new lawns, parks, parkways, and other landscaped areas where installation commences after the triggering of Stage I. However, new lawns, parks, parkways, and other landscaped areas using only drought tolerant tress, shrubs, and ground covers such as buffalo and bermuda grasses may be watered under the Stage I rules for existing lawns, parks, parkways and other landscaped areas;

Stage II:

(a) The use of Edwards Aquifer groundwater for watering of existing lawns, parks, parkways, and other landscaped areas will be allowed only for a total of thirty minutes by sprinklers and sprinkler systems on Saturday before 8:00 a.m. and after 8:00 p.m., or daily by using hand-held hoses (with or without water breakers), drip irrigation, or buckets of five gallons or less, and then only before 8:00 a.m. and after 8:00 p.m.

(b) New lawns, parks, parkways, and other landscaped areas using only drought tolerant trees, shrubs, and ground covers such as buffalo and bermuda grasses may be watered under the Stage I rules for existing lawns, parks, parkways and other landscaped areas; and

Stage III:

(a) The use of Edwards Aquifer groundwater for watering of existing lawns, parks, parkways, and other landscaped areas will be allowed only by using hand-held hoses (with or without water breakers), drip irrigation, soaker hoses, or buckets of five gallons or less, and then only before 8:00 a.m. and after 8:00 p.m.

(b) The use of Edwards Aquifer groundwater is prohibited for the watering of all new lawns, parks, parkways, and other landscaped areas.

4. Playing Fields. Turf for football, soccer, baseball and other playing fields are

exempt from water use reductions in this *Plan*.

5. Golf Courses. The Court recognizes the economic return generated by resort quality golf courses and the tourism attracted to them. In the current water supply emergency, however, golf courses can no longer be watered so as to keep the courses at their peak appearance, rather the question is, "what is the minimum amount of water necessary to keep a golf course in reasonable playing condition?" Generally, there are three areas which need healthy grass cover for reasonable playing conditions: (1) the teeing area; (2) the fairway landing area; and (3) the putting greens and the grounds immediately surrounding them. Roughs should be receive no water during droughts.

If an eighteen - hole golf course uses as much as 400,000 gallons daily, that is 2.8 million gallons a week, or 11.2 million gallons a month. Residential water use in San Antonio averages some 14,000 gallons per month per household. For the estimated 30 eighteen - hole golf courses in San Antonio alone, the approximate water usage for this purpose in the San Antonio area could be as much as 336 million gallons a month, or as much as the total average for some 23,000 residential households.

New golf courses should be restricted to the use of reuse water or water that is not withdrawn from the Edwards Aquifer. For the purposes of this *Plan* new golf courses are those where installation commences after the date this *Plan* is ordered. The following restrictions do not apply to the use of reuse water or water that is not withdrawn from the Edwards Aquifer.

Stage III:

Each eighteen - hole golf course using water from the Edwards Aquifer:

(a) Shall be restricted to no more than 11.2 million gallons of Edwards Aquifer water

per month;

(b) Shall have, or install, a meter or meters which indicate total Edwards Aquifer water applied to each course and such meter shall be accessible for inspection during normal golf course hours and when watering is occurring;

(c) May, if it has special or unusual design features which make compliance with the limitation difficult or impossible, apply to the Court for modification through the Special Master;

(d) Using all, or partly, recycled or reuse water shall be exempt from this limitation to the extent of such recycle or reuse; and

(e) Shall report its monthly water use to the Court on or before the 10th of the following month.

Golf courses executing contracts for reuse water on or before December 31, 1996, may apply to the Court through the Special Master for modification of the limitation.

The following guidelines are offered to assist golf courses in meeting the limitation:

(a) There should be no watering whatsoever of roughs. Double row or other sprinklers located in fairways, but watering roughs should not be used more than once weekly within 150 yards of the middle tees and for only 30 minutes from each sprinkler head.

(b) Fairway watering systems which are single row systems, and those using two rows of sprinklers within the fairways, may be operated only in the "landing area" between the distance 150 yards off the middle tees to a distance of 250 yards from the middle tees. On par five holes a "second landing area" (normally from 375 yards to 450 yards off the middle tees) may be similarly watered. On par three holes, there should be no fairway watering.

(c) Greens may be watered using the sprinklers immediately adjacent to the putting surface, plus to a distance 25 yards out from the putting surface.

(d) All tee sprinklers may be used.

(e) Fairway watering in "landing areas" should be limited to the application of no more than one inch per week in Stage II and no more than 0.7 inches per week under Stage III.

(f) Tee watering should be limited to one inch per week in Stage II and 0.7 inches per week in Stage III.

(g) Greens watering should be limited to 1.5 inches per week under Stage II and 1.2 inches per week under Stage III.

(h) Each course, if it has not already done so, should begin now a program to install drought resistant turf grasses on all fairways and xeriscape shrubs and trees on the full landscape.

6. Car Washing. The following restrictions do not apply to the use of reuse water or water that is not withdrawn from the Edwards Aquifer. While Stages I, II and III of the *Plan* are in effect no washing of vehicles shall be permitted except in a licensed permanent car wash facility.

7. Waste. Waste of Edwards Aquifer groundwater is strictly prohibited.

Surface Water Use in the Guadalupe Basin

> ". . . The natural flow of the Guadalupe River at Victoria today is about 7% of the monthly norm, and diversions by downstream water rights holders are now being curtailed. There is virtually no flow from the Guadalupe River into San Antonio Bay today. (Guadalupe-Blanco River Authority, *Proposed Emergency Rules of the Edwards Aquifer Authority*, July 25, 1996, p. 1.)

Due to the conditions in the Guadalupe River Basin described above, the Court urges the GBRA to encourage water purveyors within it's jurisdiction to adopt water use limitations

equally as restrictive as those pumping from the Edwards Aquifer.

DEFINITIONS of Words, Phrases and Acronyms

Acre-Foot or acft. -- Volume of water equal to one acre of land surface covered one-foot deep (325,851 gallons).

Aesthetic Use -- The use of water for fountains, waterfalls, and landscape, lakes and ponds where such use is entirely ornamental and serves no other functional purpose.

Authority -- The Edwards Aquifer Authority.

Beneficial Use -- The use of the amount of water that is economical and necessary for a purpose authorized by law, when reasonable intelligence and reasonable diligence are used in applying the water to that purpose.

Board -- The board of directors of the Authority.

cfs -- Cubic feet per second.

Commercial Use -- The use of water for stores, offices, restaurants, warehouses and other non-manufacturing activities. This category does not include water for apartments and other multifamily housing units which are considered to be municipal uses.

Conservation -- Any measure that would sustain or enhance water supply.

Discretionary Water Use -- Those beneficial uses of water which are not essential to the protection of public health and safety. Examples are lawn watering, watering of ornamental and recreational landscaping, operation of non-recirculating ornamental fountains and water features, water used for recreational or aesthetic purposes, street

and automobile washing (except to eliminate a health or safety hazard). Discretionary water use does not include water essential to an industrial or manufacturing production process. It is generally water use in excess of winter average water use. Agricultural irrigation water use is not a discretionary water use.

Domestic or Livestock Use -- Beneficial use of water for:

(A) Drinking, washing, or culinary purposes;
(B) Irrigation of a family garden or orchard the produce of which is for household consumption only; or
(C) Water for animals.

Drought of Record -- The historic drought that occurred in Texas from 1954 through 1957.

Edwards Aquifer -- That portion of an arcuate belt of porous, water-bearing, predominately carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone extending from west to east to northeast from the hydrologic division near Bracketteville in Kinney County that separates underground flow toward the Comal Springs and San Marcos Springs from underground flow to the Rio Grande Basin, through Uvalde, Medina, Atascosa, Bexar, Guadalupe, and Comal counties, and in Hays County south of the hydrologic division near Kyle that separates flow toward the San Marcos River from flow to the Colorado River Basin.

EAA -- Edwards Aquifer Authority.

ESA -- Endangered Species Act.

GBRA -- Guadalupe-Blanco River Authority.

gpcd -- Gallon per capita per day.

Industrial Water Use -- Beneficial use of water for, or in connection with, commercial or industrial activities, including manufacturing, bottling, brewing, food processing, scientific research and technology, recycling, production of concrete, asphalt, and cement, commercial uses of water for tourism, entertainment, and hotel or motel lodging, generation of power other than hydroelectric, and other business activities. Aesthetic use is included when it is an integral part of the enterprise upon which the attraction to the enterprise is founded and is essential to the success of the business, such as water parks.

Irrigation Water Use -- The beneficial use of water for the irrigation of pastures and commercial crops, including orchards.

Jeopardy -- A situation where the status of an entire species designated as threatened or endangered under the Endangered Species Act as a whole is in peril.

Landscape Watering -- The application of water to grow landscaping plants. such as flowers, ground covers, lawns, shrubs and trees.

Livestock -- Animals, beasts, or poultry collected or raised for pleasure, recreational use, or commercial use.

Manufacturing -- The assembly of new products, or the importing of new products for resale, including the mechanical or chemical transformation of materials or substances into new products.

Military Water Use -- The use of water within the confines of a military installation of the Department of Defense.

mgd -- Million gallons per day.

msl -- Mean sea level.

Municipal Use -- The use of water within or outside of a municipality and its environs whether supplied by a person, privately owned water purveyor, political subdivision, or other entity, including the use of treated effluent for certain purposes specified as follows. The term includes:

(A) The use of water for domestic use, the watering of lawns and family gardens, fighting fires, sprinkling streets, flushing sewers and drains, and recreation, including swimming pools; and

(B) The use of water in industrial and commercial enterprises supplied by a water purveyor's distribution system without special construction to meet its demands.

NPDES Permit -- A permit issued by the Texas Natural Resource Conservation Commission or the U.S. Environmental Protection Agency under the federal Clean Water Act.

Non-discretionary Water Use -- Those uses of water essential to the protection of public health and safety and for the maintenance of public services necessary for the protection of public health and safety. Examples are water for drinking, food preparation, personal hygiene, public sanitation, control or prevention of disease, and fire protection. Irrigation water use and water essential to an industrial production process or commercial activity upon which gainful employment is dependent is a non-discretionary water use.

Nonpotable Water -- Water unsuitable for human ingestion without further treatment.

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

Potable Water -- Water suitable for human ingestion without further treatment.

Public -- Owned or operated by a municipality, city, or political subdivision of the State.

Recharge -- Increasing the supply of water to an aquifer by naturally occurring channels or artificial means.

Recharge Zone -- Porous soil and rock above an aquifer, through which runoff or streams can percolate into the reservoir.

Reuse -- Authorized beneficial use for one or more purposes or use of water that remains unconsumed after the original purpose of use and before the water is discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

SAWS -- San Antonio Water System.

S.B. 1477 -- Act creating the Edwards Aquifer Authority, 73rd Legislature, Regular Session, 1993.

Sewer Effluent -- Waters collected, transported and treated by a wastewater treatment plant, but not yet discharged into a stream system.

Take -- To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or

to attempt to engage in any such conduct with regards to a species designated as threatened or endangered under the Endangered Species Act.

Treated Wastewater -- Wastewater which has been treated by a wastewater treatment plant that meets or is better than required by the plant's NPDES permit.

Underground Water -- The meaning assigned by Section 52.001, Texas Water Code.

USGS -- U.S. Geological Survey.

USFWS -- U.S. Fish and Wildlife Service

Waste (of municipal water) -- Includes, but is not limited to, allowing water to run off into a gutter, ditch or drain, or failing to repair a controllable leak.

Waste (of groundwater) -- Means:

(A) Withdrawal of underground water from the Edwards Aquifer at a rate and an amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock raising purposes;

(B) The flowing or producing of wells from the Edwards Aquifer if the water produced is not used for a beneficial purpose;

(C) Escape of underground water from the Edwards Aquifer to any other reservoir that does not contain underground water;

(D) Pollution or harmful alteration of underground water in the Edwards Aquifer by salt water or other deleterious matter admitted from another stratum or from the

surface of the ground;

(E) Willfully or negligently causing, suffering, or permitting underground water from the Edwards Aquifer to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, or road ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or order issued by the Texas Natural Resource Conservation Commission under Chapter 226, Texas Water Code.

(F) Underground water pumped from the Edwards Aquifer for irrigation that escapes as irrigation tailwater onto land other than of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge; or

(G) For water produced from an artesian well, "waste" has the meaning assigned by Section 11.205, Texas Water Code.

Wastewater -- All water discarded by water users, regardless of its quality.

Wastewater Treatment Plant -- A plant that contains a system designed to capture and treat wastewater so it can be reused and which has been issued an national pollutant discharge and elimination system permit by Texas Natural Resources Conservation Commission or the U.S. Environmental Protection Agency.

Water Purveyor -- Any person who sells or offers to sell water or wastewater at wholesale or retail to another person.

Well -- A bored, drilled or driven shaft or an artificial opening in the ground made by digging, jetting, or some other method where the depth of the shaft or opening is greater than its largest surface dimension, but does not include a surface pit, surface

excavation, or natural depression.

Well J-17 -- State well number AY-68-37-203 located in San Antonio, Bexar County.

Winter Average Water Use -- The average quantity of water withdrawn by a water purveyor or used by a customer of a water purveyor in the three lowest monthly billing periods during the period from November 1, 1995, through February 29, 1996.

Withdrawal -- An act or a failure to act which results in taking water from the Edwards Aquifer by or through man-made facilities, including pumping, withdrawing, or diverting underground water.

ATTACHMENTS

DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

29 JUL 1996

HQ AETC/CE
266 F Street West
Randolph AFB TX 78150-4321

RECEIVED AUG 0 1 1996

Mr. Thomas C. Moreno, General Manager
Bexar Metropolitan Water District
P.O. Box 3577
San Antonio TX 78211-0577

Dear Mr. Moreno

It has come to our attention that you are planning to construct a surface water treatment plant beginning in 1996 with distribution of this surface water available through the San Antonio Water System (SAWS). Given this accelerated schedule and the potential for the military bases in San Antonio to acquire potable surface water to reduce our pumpage from the Edwards Aquifer much sooner than previously anticipated, we would like to begin joint technical discussions with BMWD and SAWS concerning the purchase of such non-Edwards Aquifer water via individual installation utility contracts. We expect to need a series of meetings, with separate meetings for each installation, and a minimum of one general meeting.

If you agree, our technical representative, Ms. Judi Austen, will contact you to set up the kick-off meeting.

Sincerely

DAVID M. CANNAN, Colonel USAF
The Civil Engineer

cc:
See Distribution

DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

29 JUL 1996

HQ AETC/CE
266 F Street West
Randolph AFB TX 78150-4321

RECEIVED AUG 0 1 1996

Mr. Joe Aceves, Chairman & CEO
San Antonio Water Systems
1001 E. Market Street
San Antonio TX 78298

Dear Mr. Aceves

It has come to our attention that Bexar Metropolitan Water District (BMWD) is planning to build a surface water treatment plant beginning in 1996. We also understand that distribution of this surface water to the five military bases in San Antonio is being considered by the San Antonio Water System (SAWS). Given this accelerated schedule and the potential for the military bases to acquire potable surface water to reduce our pumpage from the Edwards Aquifer much sooner than previously anticipated, we would like to begin joint technical discussions with BMWD and SAWS concerning the purchase of such non-Edwards Aquifer water via individual installation utility contracts. We expect to need a series of meetings, with separate meetings for each installation, and a minimum of one general meeting.

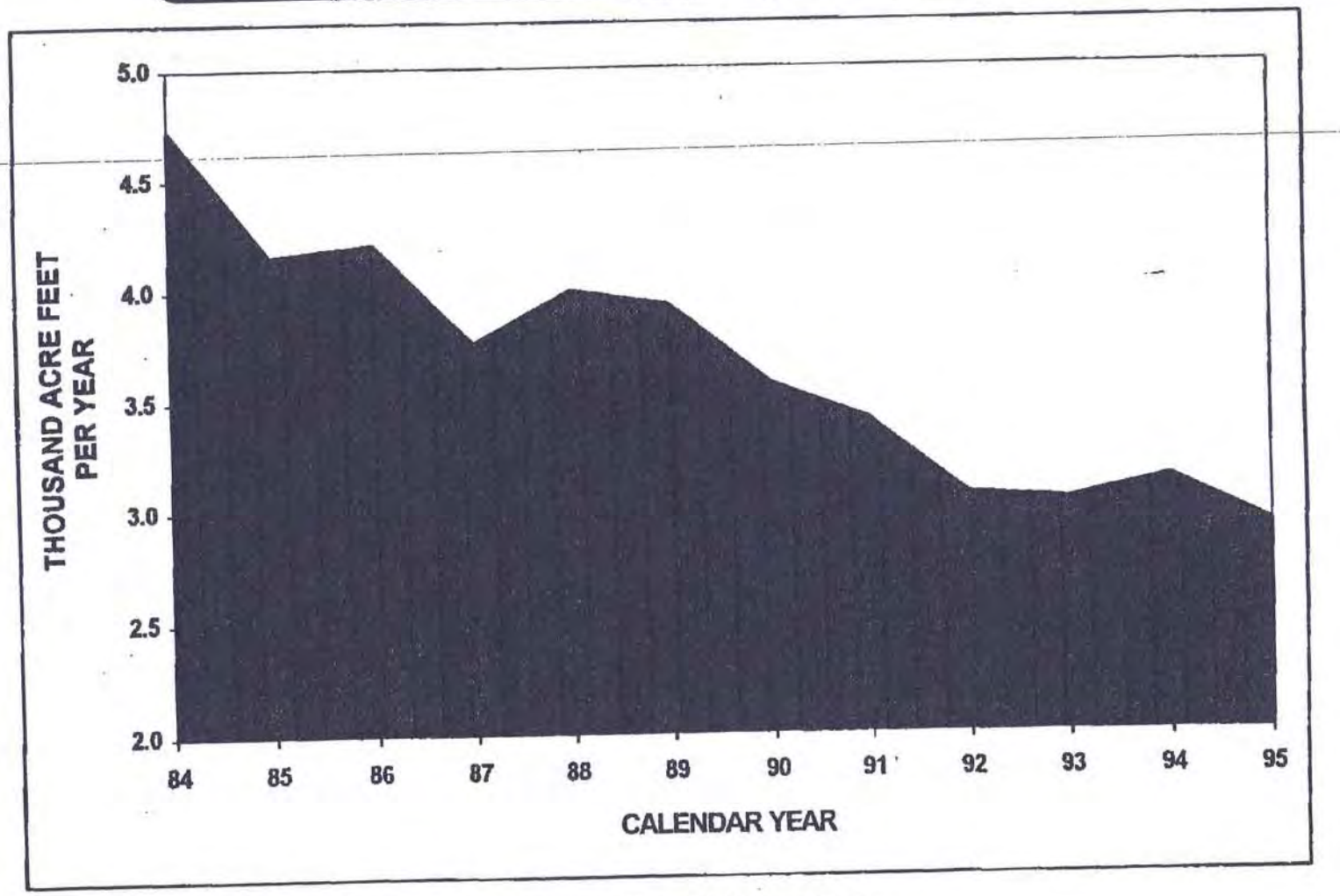
If you agree, our technical representative, Ms. Judi Austen, will contact you to set up the kick-off meeting.

Sincerely

DAVID M. CANNAN, Colonel USAF
The Civil Engineer

cc:
See Distribution

KELLY AFB WATER USE
1984 - 1995



Note: Over 35% reduction in water use from 1984 base year