

A MUNICIPAL PERSPECTIVE

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In this presentation we will concentrate on water rights for municipal use, recognizing that quality and use rates are also important and worthy of discussion.

On September 11, 1980, the State Engineer issued an Order declaring the Lower Rio Grande Basin in order to protect existing water rights from being impaired by further ground water development. The Lower Rio Grande Basin extends from Broad Canyon north of Radium Springs to the New Mexico-Texas state line on the south; the area includes approximately 1585 square miles.

Quoting from the press release issued by the State Engineer,

"The Order recognized that the surface and ground waters within the basin are interrelated; under such circumstances any ground-water withdrawal results ultimately in an equivalent diminution of surface water flows.

"Ground water appropriation will be permitted, provided that there is no impairment to other existing ground water rights and provided that the immediate and potential effects on the flow of the Rio Grande are offset by the retirement of usage under existing water rights so that the water supply to the surface water rights will be unchanged. This administrative procedure is presently used in the Rio Grande Underground Water Basin, which was declared in 1956. This administrative procedure provides for the fullest utilization of the groundwater resources in a stream related underground water basin without impairment to existing rights."

This order generated great concern within the City of Las Cruces. The full implications of the Order were not soon recognized since the City had been operating in an undeclared area, drilling wells as the need arose. No one within the utilities staff or the legal staff had experience dealing with water right questions.

We can also expect that the Order generated concern in many other community water supply organizations. In the declared basin area we have listed approximately fifty (50) domestic water suppliers. These include the mutual domestics, mobile home parks, private water systems, New Mexico State University, and others. Each of these suppliers will face similar problems securing water for growth.

We would like, in this presentation, to focus on the Las Cruces municipal water supply as a typical domestic water supplier in the basin. What are our water rights? How long will they support the City and what are the options for securing water rights for the future? What impacts will this have on growth?

First, let's discuss the existing situation. Let me state that this is as we now understand our position. These numbers do not have the blessings of the State Engineer's office. The basin management criteria has not been issued, so some modifications to these figures may be in order as things develop. As we concluded our deliberations on this paper, we began to feel like Zymurgy. As you all know, I'm sure, Zymurgy's law states, "Once you open a can of worms, the only way to recan them is to use a bigger can." At times while preparing this paper, we felt like we needed a bigger can. We may have to rely on able assistance, hopefully, in the workshop to recan them.

When the Basin was declared, the City of Las Cruces had a total system capacity of 28,399 acre-feet per year. We learned that municipalities are allowed to pump sixty percent (60%) of their total pumping capability before retirement of additional water rights is required. This amounts to 17,040 acre-feet per year.

The 1980 pumping rate was about 13,000 acre-feet, so we can continue to grow to the 17,000 acre-feet level. Because of the nature of municipal water demand, supplemental wells are permitted to meet peak flows. The annual withdrawal under existing water rights cannot exceed 17,000 acre-feet.

In analyzing our situation, we find that Las Cruces are using an average of about .29 acre-feet per capita per year (13,000 acre-feet divided by 45,000 people served). This per capita figure includes existing commercial and industrial use rates. Another approach reveals that Las Cruces require about 1.3 acre-feet per developed acre per year (13,000 acre-feet were used on 10,000 develop acres). These numbers give us a basis for projecting future water requirements. Our projections are that the 17,000 acre-feet/year permitted pumping will serve about 58,800 people or 13,000 acres of development. At expected growth rates, this population should occur in 1990.

The question then is, what happens in 1990? Where will additional water rights come from? According to the Order, and again I quote,

"Ground water appropriation will be permitted, provided that there is no impairment to other ground water rights and provided that the immediate and potential effects on the flow of the Rio Grande are offset by the retirement of usage under existing water rights so that the water supply to the surface water rights will be unchanged."

Let's look at the arithmetic of retiring surface water rights to supply municipal requirements. Surface water rights in the valley amount to 3 acre-feet per acre. We have learned that of the 3 acre-feet, .94 acre-feet finds its way back to ground water when applied as irrigation water. The remaining 2.06 acre-feet are lost to consumptive use such as plant uptake and evaporation. So, when one acre's worth of water rights are retired only 2.06 acre-feet of water rights are available for consumptive use. If, in the same case of a municipality, we assume that 50 percent of all water pumped returns to the river as sewage or to ground water through lawn irrigation, we conclude that we can actually pump twice the 2.06 acre-feet, or 4.12 acre-feet for municipal use to achieve the same consumptive use as irrigation. So, the retirement of surface water rights on 1 acre of land will allow us to serve 3.2 developed acres. We arrive at this by dividing the 4.12 acre-feet available by 1.3 acre-feet per developed acre requirement. If these assumptions are valid, and assuming that consumptive use rates for municipal and agriculture do not change, this means that for each acre of valley land that is developed, 2.2 acres of mesa land without existing water rights can be developed. The impact on the growth of Las Cruces will be that as land must be annexed land water rights must be turned over to the City at the ratio of at least 1 acre of valley land to 2.2 acres of mesa land in order to secure adequate water rights.

Another interesting administrative procedure regarding water rights retirement is that which is used in the Upper Rio Grande Basin. We assume that a similar procedure will be followed in the Lower Rio Grande

Basin. That procedure is the scheduled retirement of rights based on the projected effect on the River. A memorandum from the State Engineer's office states,

"This scheduled retirement of use under surface rights will allow municipalities and industries to appropriate ground water without impairment of existing rights and with the smallest possible disturbance to the agricultural economy of the valley. That is, the total water usage in the valley can be materially increased for a number of decades by mining a portion of the vast amount of water in storage in the aquifers; the rate of usage eventually stabilizing at approximately the present rate of consumption of both surface and ground water. The increased usage over the intervening decades can be accomplished without impairment of existing rights."

This procedure will "soften the blow" of retiring water rights.

A point that is of interest to us in a recently declared basin is how Albuquerque has handled its problem in the Upper Rio Grande Basin, which was declared in 1956. This information comes from an article written by Mr. S. E. Reynolds that was published in the Albuquerque Tribune. The article indicates that sufficient water rights exist in the Upper Rio Grande Basin for Albuquerque to grow to a 1.5 million population. Dr. Zink said this morning that Albuquerque will not reach one million in 70 years. Vested water rights allow the depletion of river flow by 18,672 acre-feet/year. This will serve 138,000 people at projected per capita consumptive rates. The City will be allowed to pump an additional 96,400 acre-feet/year which is offset by 48,200 acre-feet/year which the City has contracted from the San Juan Chama Project and by 48,200 acre-feet/year of sewage return flow. This will offset the effects of 357,000 people. Non-Indian irrigators above Elephant Butte Reservoir

have rights to deplete the flow of the river by 128,000 acre-feet per year. Transferring this right to the City of Albuquerque would offset the effects of 950,000 people. Totaling the available rights to deplete the river flow, and adding the right to pump additional water which is offset by the San Juan Chama Water, Albuquerque has potentially available the right to use consumptively 195,000 acre-feet per year. These population figures are based on a consumptive use rate of .13 acre-feet per capita per year. Considering that half of the water pumped is used non-consumptively and returned to the basin, Albuquerque must pump about .26 acre-feet per capita per year. We can only compliment them on their farsightedness in acquiring the San Juan Chama water.

Performing a similar analysis for the City of Las Cruces, we have the right to deplete the river flow 8,500 acre-feet (50% of 17,000 acre-feet). If all agricultural rights in the valley were retired to the City, as assumed in the Albuquerque example, 187,000 acre-feet of river flow depletion would be allowed. At our present consumptive use of .14 acre-feet per capita, these water rights could support a population of 1.4 million. You might be interested to know that at current densities this population would require almost 300,000 acres to live and work. Again, considering that half of the water pumped is used non-consumptively and returned to the basin, we must pump about .28 acre-feet per capita.

Mr. Reynolds concluded his article by stating, "An Albuquerque population of 1.5 million people would surely pose some difficult problems, but the water supply problem would be manageable." We could

shorten that to: A Las Cruces population of 1.4 million people would surely pose many problems!

We have, therefore, established that a population of 58,800 -- which represents an increase of 13,000 -- can be served with existing water rights. At projected per capita use rates a population greater than 58,800 can be served on a perpetual basis by retiring existing water rights under a co-development program of 1 acre of valley land for every 2.2 acres of mesa land, emphasizing that the agricultural land need not be developed immediately because of the scheduled retirement procedure. This appears to optimize water use for development and minimize the impact of development on agricultural land.

The major hurdle that we have identified is that there is now apparently no procedure within the Lower Rio Grande Basin whereby surface water rights can be secured by domestic water suppliers as land with water rights is converted to residential, commercial, or industrial uses. We are presently in discussions with the irrigation district staff to resolve this problem.

We can conclude that from a municipal perspective the Lower Rio Grande Basin can be managed so that agricultural, municipal, industrial and recreational needs can be served at present use ratios, and, if water is not transported out of the basin. Cooperation and understanding among the users is imperative. While no one likes the extra burden of operating in a declared basin, I think we all appreciate the need to carefully manage one of our most valuable resources.

FIGURE 1. WATER RIGHTS AND WATER USAGE - CITY OF LAS CRUCES

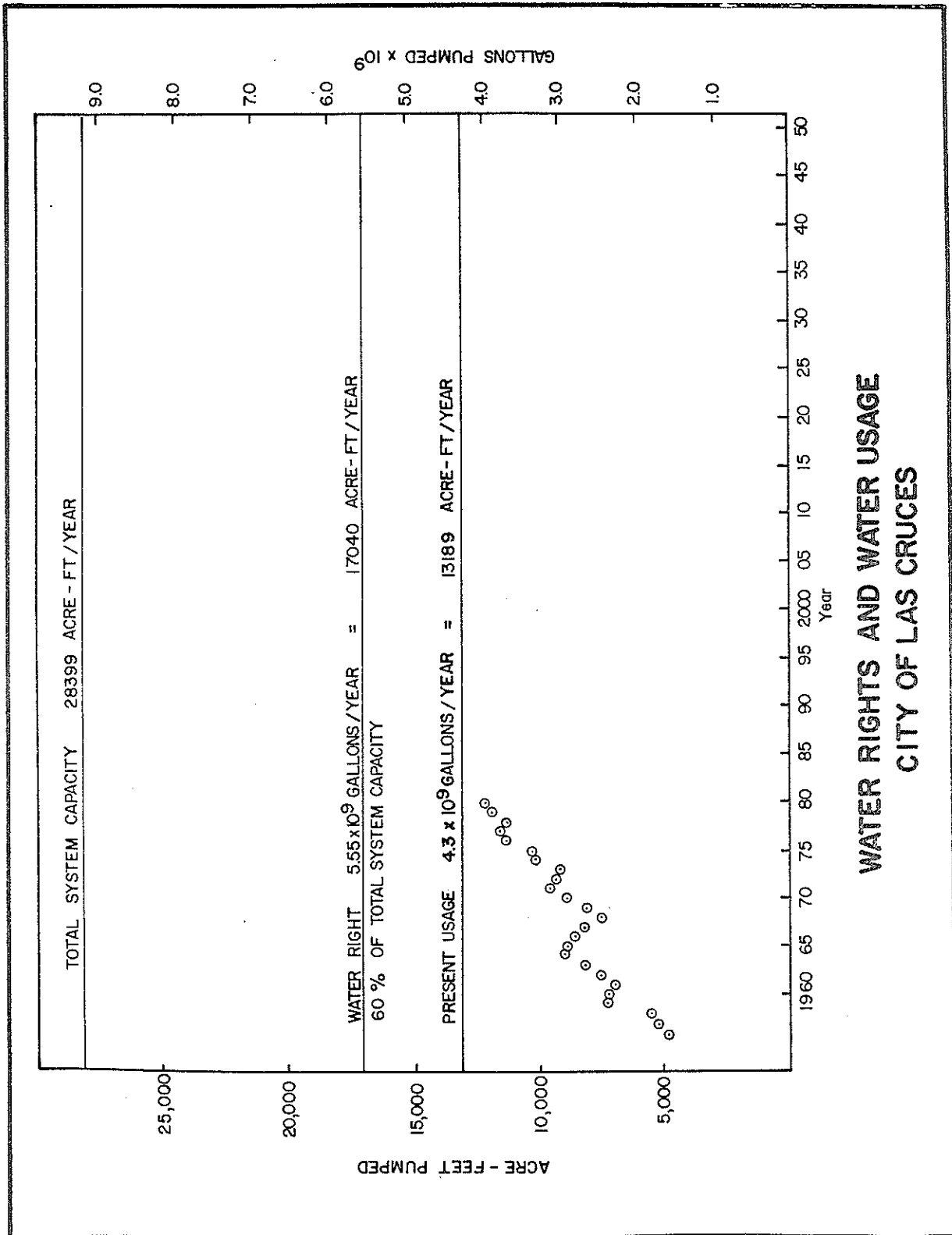


FIGURE 2. SCHEDULED RETIREMENT EXAMPLE

ASSUMPTIONS:

WELL LOCATED FIVE MILES FROM THE RIO GRANDE.

REQUIRED APPROPRIATION IS 1000 ACRE-FEET OF WATER PER ANNUM FOR MUNICIPAL USE.

APPROXIMATE CUMULATIVE AMOUNT OF
IRRIGATION WATER RETIRED UNDER SURFACE RIGHTS

1st year	90 a.f.
5th year	210 a.f.
10th year	290 a.f.
15th year	370 a.f.
20th year	420 a.f.
25th year	460 a.f.
30th year	500 a.f.

LATER, ADDITIONAL RETIREMENTS WILL BE REQUIRED SO THAT AT ALL TIMES THE TOTAL IRRIGATION WATER RETIRED WILL FULLY OFFSET THE EFFECTS OF THE GROUND-WATER WITHDRAWALS ON THE RIVER.

FIGURE 3. COMPARISON OF AGRICULTURAL AND MUNICIPAL CONSUMPTIVE USES

	<u>Water Right</u>	<u>Consumptive</u>	<u>Returned to Basin</u>
AGRICULTURAL	3	2.06	.94
MUNICIPAL	2.06	1.03	1.03
MUNICIPAL ADJUSTED FOR 50% RETURN FLOW	4.12*	2.06	2.06

All values in acre-feet/acre

* Municipalities may pump 4.12 acre-feet for each 3 acre-feet of retired surface water rights to realize a consumptive use of 2.06 acre-feet which is equal to an agricultural consumptive use of 2.06 acre-feet when 3 acre-feet are applied.

Municipal Water Requirement = 1.3 acre-feet per acre of developed land

ON A CONSUMPTIVE USE BASIS WATER REQUIREMENTS FOR AGRICULTURAL USE PER ACRE ARE 3.2 TIMES THE WATER REQUIREMENTS FOR MUNICIPAL USE PER ACRE.

FIGURE 4. CITY OF ALBUQUERQUE WATER RIGHTS

VESTED RIGHT TO DEplete RIVER FLOW	18,700 acre-feet/year
SAN JUAN CHAMA WATER	48,200 acre-feet/year
POTENTIALLY AVAILABLE DEPLETION RIGHT FROM IRRIGATORS	<u>128,000</u> acre-feet/year
TOTAL DEPLETION RIGHT AVAILABLE	194,900 acre-feet/year

$$\frac{194,900 \text{ acre-feet}}{.13 \text{ acre-feet/capita consumptive use rate}} = 1,500,000 \text{ people}$$

FIGURE 5. CITY OF LAS CRUCES WATER RIGHTS

VESTED RIGHT TO DEplete RIVER FLOW	8,500 acre-feet/year
POTENTIALLY AVAILABLE DEPLETION RIGHT FROM IRRIGATORS	<u>187,000</u> acre-feet/year*
TOTAL DEPLETION RIGHT AVAILABLE	195,500 acre-feet/year

$$\frac{195,500 \text{ acre-feet}}{.14 \text{ acre-feet/capita consumptive use rate}} = 1,400,000 \text{ people}$$

*271,800 acre-feet/year irrigation allotment x .69 (consumptive use ratio)