

7

Current Water Demand and No-Action Future Water Demand

This chapter presents the demand for water resources in the Middle Rio Grande Region (MRG Region). The data presented in this chapter assumes that no public policy changes are instituted as a result of the planning process. The effects of changes to public policy (known as “alternatives”) are presented in Chapters 8 and 9. This chapter covers the following topics:

- Present and Historic Water Uses
- Future Water Uses **by-for** a 50-Year Planning Horizon
- Future Water Use **by-for** a Seven-Generation Planning Horizon (deferred)
- Water-Use Reduction Targets per Sector
- Balancing the Budget Across Jurisdictions

7.1 Present and Historic Water Uses

As part of this planning process, the Middle Rio Grande Water Assembly (Water Assembly) and the Mid-Region Council of Governments (MRCOG) used some of the funds from the Interstate Stream Commission (ISC) to document current and historical water use in the region. Refer to Appendix C-7 for the executive summary from this report and information on obtaining a complete copy of the report (Nims et al. 2000).

Highlights from that report include how water is used throughout the entire region (Figure 7-1) and how use is distributed among the three counties covered in this plan (Figure 7-2).

7.2 Future Water Uses **by-for** a 50-Year Planning Horizon

Any effort to predict what water demand will be over multiple years represents little more than an author’s best guess. Supply rates fluctuate dramatically from year to year, decade to decade, and from century to century. Migratory, economic, and consumptive behavior of people is similarly uncertain. Any planning effort, however, needs to establish a reference from which decisionmakers can adopt and implement actions to either move toward or away from some predicted future reality.

The MRCOG, working with funding from ISC, developed a conjecture of what the region’s future might look like. Refer to Appendix C-4 for the executive summary from this report, Future Water Use Projections for the Middle Rio Grande Water Planning Region (FWUP) (MRGCOG 2001).

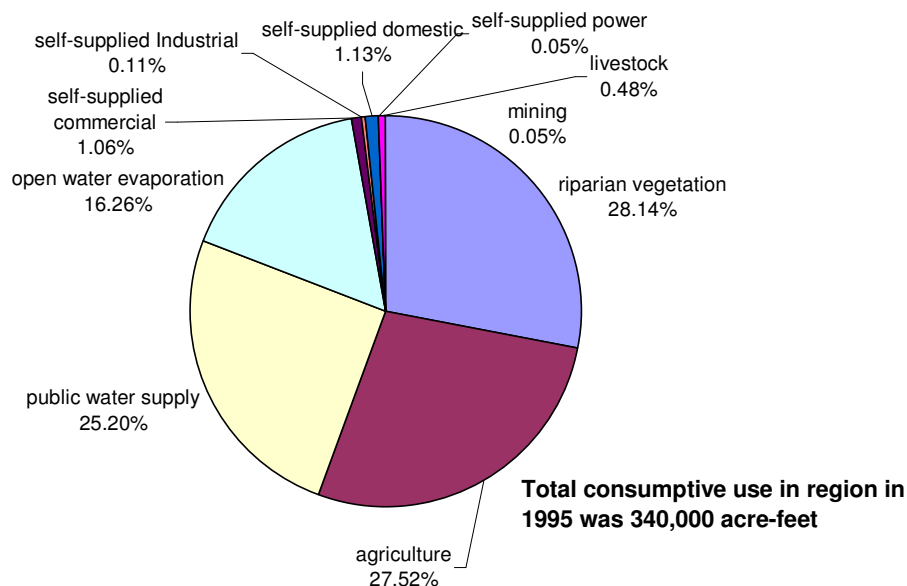
This report presents a “status quo” future water situation, meaning that if current water-use practices continue and if there are no significant policy changes or actions taken, this is what the future could look like. It is against this baseline that decisionmakers and the public can evaluate the effects of possible changes to the recent historical use and public policy.

In reality the limited water resource unequivocally prevents continuing on the present course. It is important to understand that this future baseline model presents an unrealistic picture of possible future use.

Based on technical assessments and public dialogue, individuals and organizations involved in creating this plan recommend changes to water-related behavior and public policies. Participants in the planning process evaluated the scenarios (Chapter 9) and recommendations (Chapter 10) developed by the Water Assembly by considering their perturbation to this future baseline, as well as their social, environmental, legal, economic and other effects.

Figure 7-1 Percentages of consumptive use by category in the Middle Rio Grande Region. (Source: Nims et al. 2000)

Distribution of consumptive use by category in whole region, 1995



The FWUP calculates that continuing on the present course would drive the average annual net deficit (renewable minus consumptive) of wet water from 55,000 to 150,000 acre-feet per year in just fifty years, over five million acre feet of cumulative water mining in the period. Table 7-1 shows the predicted withdrawals for various users assuming a “status quo” management option.

In spring of 2004, the official Biological Opinion regarding the silvery minnow indicates that there is a new requirement for an average additional 50,000 acre feet per year of Rio Grande flow. The implications of this new requirement on the Regional Water Plan have not been evaluated.

7.3 Future Water Uses **by-for** a Seven-Generation Planning Horizon

This section was deferred beyond the current water planning process due to resource limitations.

7.4 Water-Use Reduction Targets per Sector

At the end of 2001 and following into the spring of 2002, the Water Assembly began to work on what came to be called the water balancing exercise (WBE). The purpose of this exercise was to come up with a set of water-use numbers that would set targets for balancing the water budget by 2050.

In December 2001, five constituency groups (CGs) were formed, each representing a particular set of values. The CGs were given the baseline numbers and were instructed to make scenario of a set of targets for each sector based on that group’s values. Two of the CGs came up with two scenarios based on different sets of assumptions.

Following is a statement of each group’s interests as developed for the 6th Annual Water Assembly in 2002, and based upon the 4th Series of Community Conversations:

- Agricultural, Cultural and Historic Water Use Advocates (AC&HWA)**— Farming has been practiced in New Mexico for over a thousand years. Long before the Pilgrims arrived at Plymouth Colony, herding and ranching were being practiced here. New Mexico has always been an agriculturally based society and our history and cultures are founded on it. Today, America loses over 1 million acres of farmland a year to urban sprawl, and New Mexico is no exception. The AC&HWA CG seeks to preserve agricultural practice, economies, lifestyles, and water rights

The AT reviewed and synchronized the numbers and came up with two sets of numbers, current use and future no-change use in 2050. This proved to be a complex task as the three primary data sources each categorized water use in different ways.

- The original Water Budget listed ground-water mining at 70,000 afpy. This number was subsequently adjusted to 55,000 afpy. The ~~3026~~-year average, which was the basis of the 70,000 afpy number, did not take into account that during those years, about 15,000 afpy of the San Juan-Chama Project diversion was being used to fill the Heron Lake reservoir. [This 15,000 afpy would have been available to contractors, had they called for it.](#)
- An adjustment was made after it was pointed out that the Middle Rio Grande Conservancy District's (MRGCD) estimate of agricultural acres differed from the number used by FWUP. The FWUP set out 36,377 acres for current agriculture use, and estimated that 28,720 would be so utilized in 2050. According to the U.S. Department of Agriculture, MRGCD, and the Bureau of Reclamation, current irrigated acres are much higher—in the neighborhood of 48,000 acres. Using the percentage difference shown in FWUP but not the actual acreage, the decision was made to use 36,000 for the future irrigated acres (MRGCOG 2001).
- Three categories from the Water Budget, (gauged) Tributary Inflow, Deep Ground-water Inflow, and Mountain-Front and Tributary Recharge, were combined under the single WBE category Tributary and Ground-water Inflows.
- The Water Budget claims 90,000 afpy for all consumed ground water. However, for purposes of the WBE, this was split into two categories, Domestic Uses; and Office, Business, Commercial, and Industrial Uses. The amount was split 64% to 36%, respectively.
- Current and expected population numbers come from FWUP. The numbers of current and future expected jobs in the region were taken from Bureau of Business and Economic Research (BBER) data (BBER 2001).

The AT faced challenges to the numbers, which resulted in numerous revisions. In part this resulted as new people got involved in the middle of the WBE process, who had no understanding of the origin, who brought new insights and/or who brought new information to the originally agreed-upon numbers. In the long run, challenges to the baseline numbers resulted in better numbers. However, the changes made the WBE itself was a long and torturous process. In fact, as late as summer 2003, long after the conclusion of the WBE, several of the basis numbers were still being disputed, notably the number of acres undergoing agricultural irrigation, and the number of acres of riparian vegetation.

7.4.2 No-Action Year 2050 Usage

The no-action numbers came from three sources. In some cases it was assumed that if no action were taken, the current numbers would not change. In other cases, for instance, urban water use, an adjustment was made based on a projected increase in population. Adjusted numbers were taken from FWUP for Irrigated Agriculture Uses; Office, Business, Commercial, and Industrial Uses; and Domestic Uses. Population growth numbers were taken from BBER data (BBER 2001).

7.4.3 Water Deficit

The current use budget (see Chapter 6) shows an adjusted annual deficit of 55,000 afpy. The annual projected no-action 2050 usage *deficit* is estimated at 150,000 afpy. The challenge was to find a way to reduce the current and future deficits to zero. In addition to adjusting the amount of water to be used in each category from the water budget, teams were given the option of eliminating evaporative loss from Elephant Butte reservoir or of importing water from the Socorro-Sierra Region or from another source; however, the team had to specify what that other source would be.

The results of continuing to add annual deficits to the accumulated debt of approximately half a cubic mile, or 1.7 million acre feet, is illustrated in a recent USGS report. "The recent (1999 to 2002) water levels presented in this report indicate that beneath the Albuquerque metropolitan area, ground water on either

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side of the Rio Grande currently flows toward the major pumping centers from all directions” (Bexfield and Anderholm 2002).

7.4.4 Instructions to Participants

Each Constituency Group tackled the exercise, trying to balance the water budget from their interests' perspective. They were provided with the instructions how to do the exercise (Supporting Document I). In addition to details about each of the water categories in the exercise, participants received nine bullet points drawn from the Middle Rio Grande Water Supply Study, reproduced here:

Key water supply and hydrologic concepts illustrated or derived from this study, with implications for water planning are:

- On average, *the present water supply is barely adequate* (including San Juan-Chama Project water and groundwater withdrawals) to meet the present demands in the Middle Rio Grande region.
- *The water supply is highly variable*, due to the high variability in Otowi inflow and the high variability in evaporation from the Elephant Butte Reservoir.
- Given the variability of water budget terms, Rio Grande Compact debit conditions are expected to occur nearly as frequently as credit conditions.
- *Under conditions of increased water use in any sector, a reduction of water use from other sectors is required* to maintain overall water supply balance, and to avoid increasing the likelihood of incurring Rio Grande Compact debits.
- The groundwater supply is not an independent, disconnected water supply. *Use of ground water results in diminished flows of the Rio Grande* that will occur in the present and continue into the future.
- The location of groundwater well fields affects short-term timing of impacts to the river; however, regardless of location, the impacts of ground-water pumping eventually reach the river and require offset.
- Recharge of groundwater from the stream system reduces the flow of the Rio Grande available to meet obligations under the Rio Grande Compact.
- *The water supply from Otowi to Elephant Butte is essentially a single supply*; water use in every sub-region of the Middle Rio Grande affects the water available to the entire region.
- *The water supply is only depleted by consumptive use*; reductions in diversions and return flows resulting in better delivery efficiency do not necessarily improve the water supply.

In summary, the water supply of the Middle Rio Grande is marked by limitation and variability. The successful water planning process will operate in recognition of these concepts (S. S. Papadopoulos & Associates 2000).

7.4.5 Specialists' Scenarios

The SCG came up with two scenarios. They began by using a low population series from Appendix A in FWUP(MRGCOG 2001) in preparing the Minimum scenario and then lowered all water-use coefficients across the board to the minimum they thought practicable. They also relocated a substantial amount of Elephant Butte storage to reduce evaporation losses (Table 7-4).

Because that scenario produced a "surplus," they experimented with a higher population series which they called the Maximum scenario. This scenario produced a deficit which was made up through importations from Socorro-Sierra Region (Table 7-5).

7.4.6 Agricultural Users Scenarios

The AC&HWA developed two scenarios. Scenario I reflects the overall values of the agricultural users in desiring to preserve farming in the region. Scenario II showed the savings that could be gained by freezing all urban use at its current level. This would be accomplished by establishing strict conservation measures throughout the region and finding a way (not specified) to freeze job and population growth (Tables 7-6 and 7-7).

7.4.7 Environmental Scenario

The priority in the EA's scenario is to preserve the riparian environment, if necessary, at the expense of growth (Table 7-8).

7.4.8 Urban User and Economic Developers Scenario

The UUEDA used a balanced approach requiring more efficiency out of all water users while maintaining a high quality of life, and accommodating expected increases in population (Table 7-9).

7.4.9 The Water Balancing Model

The Cooperative Modeling Team (CMT) along with Sandia National Laboratories developed a software program that attempted to reflect the interaction among the categories of inflow and use. The program could be used to show how increases or decreases in water use in various sectors would affect the overall water budget (Figure 7-4). The early version of this model is known as the "mini model." The later version is called the Middle Rio Grande model (MRG model). This program became the vehicle for presenting water balancing to the public.

The "mini model" was presented at the 4th Series of Community Conversations held in March, 2002, in Albuquerque, Rio Rancho, and Los Lunas.

Attendees were divided into several teams, each with their own copy of the model. Each group was encouraged to adjust the usages of water to achieve an overall balance. The resulting balanced budgets (or unbalanced budgets) were presented to the whole group along with an explanation of the changes chosen.

Perhaps the most striking realization by participants in this process was that if the open water evaporation from Elephant Butte Reservoir were eliminated, it would balance the water deficit. (Unfortunately, storage of the water is governed by the Rio Grande Compact, which could only be changed with great political difficulty.)

7.4.10 The Sixth Annual Assembly

The results of the CCs were reviewed by the CGs, who used the input to modify their initial positions. The modified results were presented at the 6th Annual Assembly in 2002.

7.4.11 A Balancing Act

The Water Assembly never agreed upon a single, final target set of numbers. Rather, the CGs presented their scenarios. Results of the balancing exercise are presented in Supporting Document I. Figures 7-5 and 7-6 and Table 7-10 summarize the results. Interestingly, when each scenario's numbers are viewed as a percentage of their entire budget, the percentages do not differ widely.

7.4.12 Conclusions on Balancing Exercise

The WBE was intended as a first step toward balancing the water budget. The exercise showed just how hard it was to balance the budget given the constraints present in the region. It also showed how a balanced budget might be obtained in different ways depending on the values applied to the process.

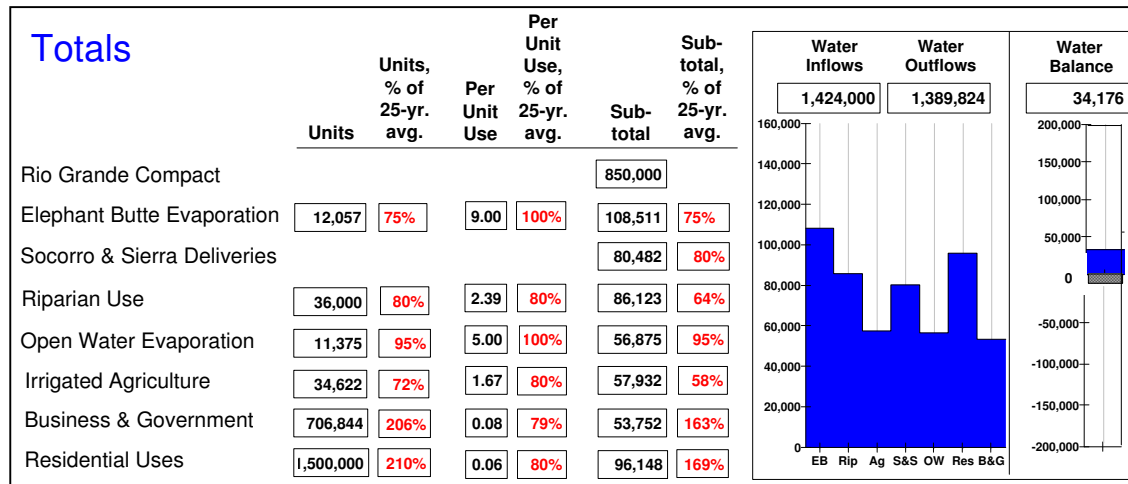


Figure 7-4 Sample of a Balanced Budget (Source: The Middle Rio Grande Water Assembly)

NOTE: "Units" in the model were: acres for Elephant Butte Evaporation, for Riparian Use, for Open Water Evaporation and for Irrigated Agriculture; jobs for Business and Government, and population for Residential Uses.

Figure 7-5 Total Use of Water (Source: The Middle Rio Grande Water Assembly)

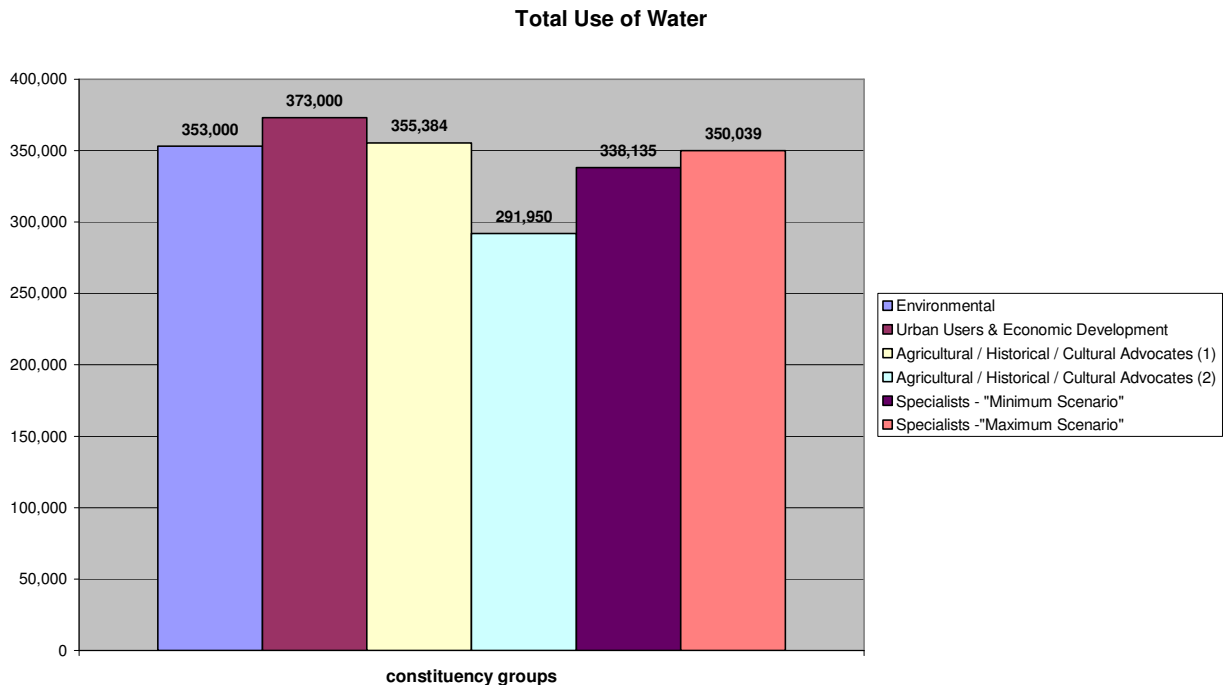


Table 7-4 (continued) Specialists' Minimum Scenario (Source: The Middle Rio Grande Water Assembly)

Specialists - "Minimum Scenario"		Desired Year 2050 Use Budget				Assumptions
		A Number of Units	x	B Per Unit Use	=	
<i>Uses of Water within the Region</i>						
12	Riparian Uses	45,000 riparian acres		2.39 afpy per riparian acre		107,476 Changed ET/Acre from 3 to 2.39 (20% reduction)
13	Open Water Uses (Other than Elephant Butte)	12,000 open water acres		5.0 afpy per open water acre		60,000 River areas = Rio Grande 6900 acres & Jemez 2600 acres. Conversion to closed onduit (main laterals and drains) was judged to be ~10% due to slope constraints, etc. or about 83.4 miles that could be converted.
14	Irrigated Agriculture Uses	33,970 irrigated acres		1.75 afpy per irrigated acre		59,405 34,000 acres (30% reduction) ; ET/Acre 2.1 to 1.75 (7% reduction); Total Use 100,000 to 59,712 ac-ft. (40% reduction in consumptive use). Additional crop changes, etc. could drive this lower.
15	Office, Business, Commercial, and Industrial Uses	551,196 jobs		0.08 afpy per job		42,197 Jobs. 343,000 to 550,000 (152%) (based on FWUP Series B); Per Job use 0.096 to 0.08 (79%); Total Use 33,000 to 42,197 ac-ft. (111%)
16	Domestic Uses	1,150,943 persons		0.06 afpy per person		69,057 Population – 712,000 to 1,150,943 people (161%) (based on FWUP Series B); Per Capita use 0.08 to 0.06 (75%); Total Use 57,000 to 80,362 ac-ft. (128%) Population was increased based on FWUP Series C. Consumptive use projected as 0.08 to 0.06 ac-ft/person.

Table 7-4 (continued) Specialists' Minimum Scenario (Source: The Middle Rio Grande Water Assembly)

Specialists – “Minimum Scenario”		Desired Year 2050 Use Budget				Assumptions
		A Number of Units	x	B Per Unit Use	=	
17	<i>Total Use of Water within the Region</i>	N/A		N/A		338,135
18	Net (renewable minus consumption)	N/A		N/A		40,589

Table 7-5 (continued) Specialists' Maximum Scenario (Source: The Middle Rio Grande Water Assembly)

Specialists – “Maximum Scenario”		Desired Year 2050 Use Budget					Assumptions
		A Number of Units	x	B Per Unit Use	=	C Total Water Use (afpy)	
17	<i>Total Use of Water within the Region</i>	N/A		N/A		350,039	
18	Net (renewable minus consumption)	N/A		N/A		-20,039	

Table 7-6 AC&HWA Scenario I (Source: The Middle Rio Grande Water Assembly)

Agricultural / Historical / Cultural Advocates - Scenario I Water Line Item		Desired Year 2050 Use Budget				Assumptions	
		A Number of Units	x	B Per Unit Use	=		C Total Water Use (afpy)
<i>Inflows to the Middle Rio Grande Region</i>							
1	Rio Grande Native Inflows	N/A		N/A		1,100,000	Inflows stayed constant
2	Tributary and Ground-water Inflows	N/A		N/A		245,000	
3	San Juan/Chama Inflows	N/A		N/A		74,000	
4	Imports from Socorro/Sierra Region	N/A		N/A		0	
5	Imports from Other Sources (must identify the source)						
6	Urban Storm Drain Inflow	N/A		N/A		5,000	
7	<i>Total Water Income to the Region</i>	N/A		N/A		1,424,000	
<i>Uses of Water within the Region</i>							
8	Elephant Butte Lake Evaporation	18,249 surface acres		6.5 afpy per surface acre		118,616	Real numbers = 144,000 acft & 6.5 acft per acre evaporation. Reduce the surface area to the legal minimum (12,000 acres), subtract that from the real (22,000) acres, then multiply that by 4 acft evap in the northern part of the state, multiply the 12,000 acres by 6.5.
9	Socorro/Sierra Region Current Delivery Rate	N/A		N/A		100,000	
10	Rio Grande Compact Deliveries	N/A		N/A		850,000	
11	<i>Total Required Deliveries Outside of the Region</i>	N/A		N/A		1,068,616	

Table 7-6 (continued) AC&HWA Scenario I (Source: The Middle Rio Grande Water Assembly)

Agricultural / Historical / Cultural Advocates - Scenario I Water Line Item		Desired Year 2050 Use Budget				Assumptions
		A Number of Units	x	B Per Unit Use	=	
<i>Uses of Water within the Region</i>						
12	Riparian Uses	42,000 riparian acres		3.0 afpy per riparian acre		126,000 Some riparian losses due to land use change in areas outside the levees, and some losses from the reduction of ditchbank riparian when conveyances are lined or covered.
13	Open Water Uses (Other than Elephant Butte)	10,000 open water acres		5 afpy per open water acre		50,000 Open water changed from ditch/drain covering and/or eliminating, and from less water in the river meaning less evap losses. (fairly small change)
14	Irrigated Agriculture Uses	45,000 irrigated acres		2.1 afpy per irrigated acre		94,500 Some ag acreage losses, although the trend has slowed in recent years. Also, a significant portion of this land is in tribal hands, and is therefore untouchable. Ag land also includes the giant backyards which are not subject to land use change.
15	Office, Business, Commercial, and Industrial Uses					33,000 The “per job” line was eliminated as this completely ignored home based businesses and all ag related economies, including the ag dependent retail and wholesale. Line 15 and 16 were combined into “urban” uses.
16	Domestic Uses	898,244 persons		0.0945 afpy per person		84,884 The use was reduced to .0945 afpy per person to reflect a per capita water metering of about 160 gallons per day, well over Tucson and El Paso and Santa Fe, but less than Albq. Current 209 gallons per day. This is just conservation that other cities do. Population growth limited by resource, quality of life decisions, and tribal sovereignty.

Table 7-6 (continued) AC&HWA Scenario I (Source: The Middle Rio Grande Water Assembly)

Agricultural / Historical / Cultural Advocates - Scenario I Water Line Item		Desired Year 2050 Use Budget					Assumptions
		A Number of Units	x	B Per Unit Use	=	C Total Water Use (afpy)	
17	<i>Total Use of Water within the Region</i>	N/A		N/A		355,384	
18	Net (renewable minus consumption)	N/A		N/A		0	

Table 7-7 AC&HWA Scenario II (Source: The Middle Rio Grande Water Assembly)

Agricultural / Historical / Cultural Advocates - Scenario II Water Line Item		Desired Year 2050 Use Budget				Assumptions	
		A Number of Units	x	B Per Unit Use	=		C Total Water Use (afpy)
<i>Inflows to the Middle Rio Grande Region</i>							
1	Rio Grande Native Inflows	N/A		N/A		1,100,000	
2	Tributary and Ground-water Inflows	N/A		N/A		245,000	
3	San Juan/Chama Inflows	N/A		N/A		74,000	
4	Imports from Socorro/Sierra Region	N/A		N/A		0	
5	Imports from Other Sources (must identify the source)						
6	Urban Storm Drain Inflow	N/A		N/A		5,000	
7	<i>Total Water Income to the Region</i>	N/A		N/A		1,424,000	
<i>Uses of Water within the Region</i>							
8	Elephant Butte Lake Evaporation	16,000 surface acres		9.0 afpy per surface acre		144,000	Any solution or reduction is nigh impossible
9	Socorro/Sierra Region Current Delivery Rate	N/A		N/A		100,000	
10	Rio Grande Compact Deliveries	N/A		N/A		850,000	Beneficial changes to Compact deliveries appear to be impossible
11	<i>Total Required Deliveries Outside of the Region</i>	N/A		N/A		1,094,000	

Table 7-7 (continued) AC&HWA Scenario II (Source: The Middle Rio Grande Water Assembly)

Agricultural / Historical / Cultural Advocates - Scenario II Water Line Item		Desired Year 2050 Use Budget				Assumptions
		A Number of Units	x	B Per Unit Use	=	
<i>Uses of Water within the Region</i>						
12	Riparian Uses	45,000 riparian acres		2.5 afpy per riparian acre		112,500 Reduced use by .5ac/ft/acre because of exotics removal. 10,000 less acres turned into ag. Maintenance at 2.0ac/ft/acre
13	Open Water Uses (Other than Elephant Butte)	12,000 open water acres		5.0 afpy per open water acre		60,000 Added 10,000 acres of former riparian as maintenance. Extra water from ag. Conservation
14	Irrigated Agriculture Uses	34,000 irrigated acres		1.8 afpy per irrigated acre		61,200
15	Office, Business, Commercial, and Industrial Uses	250,000 jobs		0.073 afpy per job		18,250 jobs reduced to fit resource availability
16	Domestic Uses	500,000 persons		0.08 afpy per person		40,000 jobs reduced to fit resource availability
17	<i>Total Use of Water within the Region</i>	N/A		N/A		291,950
18	Net (renewable minus consumption)	N/A		N/A		38,050

Table 7-8 Environmentalists' Scenario (Source: The Middle Rio Grande Water Assembly)

Environment Advocates		Desired Year 2050 Use Budget				Assumptions
		A Number of Units	x	B Per Unit Use	=	
<i>Inflows to the Middle Rio Grande Region</i>						
1	Rio Grande Native Inflows	N/A		N/A		1,100,000
2	Tributary and Ground-water Inflows	N/A		N/A		245,000
3	San Juan/Chama Inflows	N/A		N/A		74,000
4	Imports from Socorro/Sierra Region	N/A		N/A		0
5	Imports from Other Sources (must identify the source)					0,000
6	Urban Storm Drain Inflow	N/A		N/A		8,000
7	<i>Total Water Income to the Region</i>	N/A		N/A		1,427,000
<i>Uses of Water within the Region</i>						
8	Elephant Butte Lake Evaporation	13,780 surface acres		9 afpy per surface acre		124,000
9	Socorro/Sierra Region Current Delivery Rate	N/A		N/A		100,000
10	Rio Grande Compact Deliveries	N/A		N/A		850,000
11	<i>Total Required Deliveries Outside of the Region</i>	N/A		N/A		1,074,000

Table 7-8 (continued) Environmentalists' Scenario (Source: The Middle Rio Grande Water Assembly)

Environment Advocates		Desired Year 2050 Use Budget				Assumptions
		A Number of Units	x	B Per Unit Use	=	
<i>Uses of Water within the Region</i>						
12	Riparian Uses	56,250 riparian acres		2.4 afpy per riparian acre		135,000 10,000 includes 10,000 afpy for instream flows
13	Open Water Uses (Other than Elephant Butte)	10,000 open water acres		5 afpy per open water acre		50,000
14	Irrigated Agriculture Uses	34,000 irrigated acres		2 afpy per irrigated acre		68,000 expect a small increase in irrigation efficiency
15	Office, Business, Commercial, and Industrial Uses					33,000 water for new uses must be obtained by conservation
16	Domestic Uses					57,000 water for new uses must be obtained by conservation
17	<i>Total Use of Water within the Region</i>	N/A		N/A		353,000
18	Net (renewable minus consumption)	N/A		N/A		0

Table 7-9 Urban Users' Scenario (Source: The Middle Rio Grande Water Assembly)

Urban Users & Economic Development Advocates Water Line Item		Desired Year 2050 Use Budget				Assumptions	
		A Number of Units	x	B Per Unit Use	=		C Total Water Use (afpy)
<i>Inflows to the Middle Rio Grande Region</i>							
1	Rio Grande Native Inflows	N/A		N/A		1,100,000	Water transfer through open market Increase urbanization will cause more pavement with more rain water run off
2	Tributary and Ground-water Inflows	N/A		N/A		245,000	
3	San Juan/Chama Inflows	N/A		N/A		74,000	
4	Imports from Socorro/Sierra Region	N/A		N/A		10,000	
5	Imports from Other Sources (must identify the source)					0,000	
6	Urban Storm Drain Inflow	N/A		N/A		10,000	
7	<i>Total Water Income to the Region</i>	N/A		N/A		1,439,000	
<i>Uses of Water within the Region</i>							
8	Elephant Butte Lake Evaporation	18,249 surface acres		6.5 afpy per surface acre		117,000	Decrease Elephant Butte's surface size. Possibilities include making lake deeper, moving a portion up north or naturally shrinking size for water conservation.
9	Socorro/Sierra Region Current Delivery Rate	N/A		N/A		90,000	Imported 10,000 above
10	Rio Grande Compact Deliveries	N/A		N/A		850,000	Beneficial changes to Compact deliveries appear to be impossible (UUED Group would like to see if this can be negotiated)
11	<i>Total Required Deliveries Outside of the Region</i>	N/A		N/A		1,057,000	

Table 7-9 (continued) Urban Users' Scenario (Source: The Middle Rio Grande Water Assembly)

Urban Users & Economic Development Advocates Water Line Item		Desired Year 2050 Use Budget				Assumptions
		A Number of Units	x	B Per Unit Use	=	
<i>Uses of Water within the Region</i>						
12	Riparian Uses	42,000 riparian acres		3.0 afpy per riparian acre		130,000 Increase open space within the bosque and decrease non-native plants to decrease consumptive use
13	Open Water Uses (Other than Elephant Butte)	12,000 open water acres		4 afpy per open water acre		48,000 Reduce evaporation in open ditches and lessen conveyance losses
14	Irrigated Agriculture Uses	34,000 irrigated acres		1.9 afpy per irrigated acre		65,000 Kept ag lands to same 2050 amount; increased efficiency (10%) while maintaining shallow aquifer benefits
15	Office, Business, Commercial, and Industrial Uses	707,000 jobs		.0672 afpy per job		48,000 Used BBER predicted jobs and require increase water efficiency by 30 % from today's use.
16	Domestic Uses	1,470,000 persons		.056 afpy per person		82,000 Used FWUP predicted population and require increase water efficiency by 30 % from today's use.
17	<i>Total Use of Water within the Region</i>	N/A		N/A		373,000
18	Net (renewable minus consumption)	N/A		N/A		9,000 Water Balanced in 2050. UUED Group used a balanced approach requiring more efficiency out of all water users while maintaining a high quality of life.

Table 7-10 Water Balancing Exercise Results by Constituency Group (Source: The Middle Rio Grande Water Assembly)

Constituency Group	Elephant Butte Lake Evaporation			Riparian Uses			Open Water Uses (Non-EB)		
	Acres	Afpy / acre	Acre feet	Acres	Afpy / acre	Acre feet	Acres	Afpy / acre	Acre feet
Current Usage	16,000	9	144,000	45,000	3	135,000	12,000	5	60,000
Future Usage (FWUP)	16,000	9	144,000	45,000	3	135,000	12,000	5	60,000
Environmental	13,780	9	124,000	56,250	2.4	145,000	10,000	5	50,000
Urban Users & Economic Development	18,249	6.5	117,000	42,000	3	130,000	12,000	4	48,000
Agricultural / Historical / Cultural Advocates (1)	18,249	6.5	118,616	42,000	3	126,000	10,000	5	50,000
Agricultural / Historical / Cultural Advocates (2)	16,000	9	144,000	45,000	2.5	112,500	12,000	5	60,000
Specialists - "Minimum Scenario"	11,964	7.96	95,276	45,000	2.39	107,476	12,000	5	60,000
Specialists - "Maximum Scenario"	16,000	9	144,000	45,000	2.39	107,476	12,000	5	60,000

Table 7-10 (continued) Water Balancing Exercise Results by Constituency Group (Source: The Middle Rio Grande Water Assembly)

Constituency Group	Irrigated Agriculture Uses			Office, Business, Commercial, and Industrial Uses			Domestic Uses		
	Acres	Afpy / acre	Acre feet	Jobs	Afpy / job	Acre feet	Persons	Afpy / person	Acre feet
Current Usage	48,000	2.1	100,000	343,000	0.096	33,000	713,000	0.08	57,000
Future Usage (FWUP)	34,000	2.1	72,000	707,000	0.073	52,000	1,470,000	0.08	118,000
Environmental	34,000	2	68,000			33,000			57,000
Urban Users & Economic Development	34,000	1.9	65,000	707,000	0.0672	48,000	1,470,000	0.056	82,000
Agricultural / Historical / Cultural Advocates (1)	45,000	2.1	94,500				898,244	0.0945	84,884
Agricultural / Historical / Cultural Advocates (2)	34,000	1.8	61,200	250,000	0.073	18,250	500,000	0.08	40,000
Specialists - "Minimum Scenario"	33,970	1.75	59,405	551,196	0.08	42,197	1,150,943	0.06	69,057
Specialists - "Maximum Scenario"	33,970	1.75	59,405	707,000	0.08	54,101	1,150,943	0.06	69,057

Table 7-10 (continued) Water Balancing Exercise Results by Constituency Group (Source: The Middle Rio Grande Water Assembly)

	Total Use	Net (renewable minus consumption) Total Surplus
Constituency Group	Acre feet	Acre feet
Current Usage	385,000	
Future Usage (FWUP)	437,000	
Environmental	353,000	0
Urban Users & Economic Development	373,000	9,000
Agricultural / Historical / Cultural Advocates (1)	355,384	0
Agricultural / Historical / Cultural Advocates (2)	291,950	38,050
Specialists - "Minimum Scenario"	338,135	40,589
Specialists - "Maximum Scenario"	350,039	-20,039

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