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Introduction

This chapter contains introductory information concerning this regional water plan for the Middle Rio Grande Region (MRG Region). The following topics are included:

- Nature of This Document
- Need for Water Planning
- Purpose of This Regional Water Plan
- Context within New Mexico Water Planning
- Mechanism for Providing Comment
- Previous Water Planning in the Region
- Project Timetable
- Summary of Document Content
- Glossary

1.1 Nature of This Document

This document is the repository for MRG Region water planning data and decisions to date, as gathered, discussed, analyzed, and proposed through numerous open planning sessions and public meetings in the MRG Region of New Mexico. As this plan and process evolve, so will this document, since neither is static.

It is important to emphasize that there are very significant uncertainties involved in this planning process. Among them are:

- Precision of measurements
- Predictions of future water supplies and demands
- Quantification of pueblo rights and other private property rights
- Assumptions about use of private property rights
- Institutional concerns such as unused water permits, localized water supply and demands, etc.
- Assumptions about importation of water
- Pending decisions in various litigations
- Priority administration with or without adjudication
- Political will

1.2 Need for Water Planning

New Mexico is a land of limited water. The MRG Region, which encompasses Bernalillo, Sandoval, and Valencia counties, is home to 39 percent of New Mexico's population. Not surprisingly this region places the highest demand on the state's water supply, and as the population increases, the demand is also increasing.

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However, the average renewable supply of water does not change, although it varies from year to year according to weather conditions. The MRG Region sits on top of the Santa Fe Group aquifer, a reserve which the region is using to subsidize current water demands. The aquifer is replenished at a much slower rate than the current use and as a result the water table is dropping. With the demand already exceeding the renewable supply, the condition will only become more acute unless a careful plan for water management and conservation is implemented.

In addition to regional water plans, New Mexico needs a practical state water plan to ensure the future of its residents. A New Mexico state water plan, along with regional water plans, will help protect New Mexico water supplies from interstate claims, and will help New Mexicans make the best use of their limited supplies. The regional water plans provide balanced water management strategies for each region and will be used to help implement a state water plan. Other western states, including Arizona, Texas, Oklahoma, Colorado, California, and Utah, have state water plans that show how the states intend to match water supply with demand

The Middle Rio Grande Regional Water Plan is needed to ensure an adequate supply of affordable quality water to meet the region's human and environmental needs while maintaining all desired New Mexican lifestyles. Without a regional water plan, the region will be susceptible to short-term interests at the expense of broader long-term interests. It will lead to spending precious resources resolving competing interests—agricultural, environmental, industrial, residential, traditional, etc.

Consequences and impacts which eventually surface will be very difficult to reverse. Specific risks include financial costs of failure to meet downstream obligations, economic costs of water shortages, drying or quality degradation of our water supply, impacts to the environment, land subsidence, outside appropriation of water, and loss of those lifestyle and cultural attributes that make New Mexico and the region unique.

Water planning on a regional basis is important because the hydrological situation is so much broader than any one of the jurisdictions in the region. With some localized exceptions, the jurisdictions are all drawing on the same surface and groundwater supplies. Actions taken or not taken by one jurisdiction have both long-term and short-term implications for neighboring jurisdictions.

In this regional planning effort, it must be recognized that several jurisdictions within the region have already established meaningful water planning and strategy efforts. For example, the City of Albuquerque has embarked on a strong consumer conservation program and is intending to use its full allocation of surface San Juan-Chama Project water to reduce groundwater pumping in meeting its current needs for water. This will allow for partial aquifer recovery, until demand increases enough to again require heavy levels of pumping. Regional water planning should be coordinated with those existing local efforts, in the same way that local planning should be coordinated with this regional water planning effort.

A few historical points should be cited here:

- In 1982, the United States Supreme Court ruled in the case of Sporhase v. Nebraska (1982) that water was a commodity subject to interstate commerce regulations and that a state could not restrict its flow across state lines without a plan demonstrating critical need. Refer to Section 1.4.1 for details.
- In the early 1980s, El Paso filed suit against New Mexico seeking additional water through well permits. The ruling in City of El Paso v. Reynolds (1983) relied on the Sporhase decision when determining that New Mexico could not bar El Paso from seeking such permits based solely on wanting to keep groundwater within the state. The court did, however, set out certain conditions where a state might be able to meet the needs of its residents first. Such a decision gave rise to regional water planning in New Mexico, as can be seen in the resultant statutes.
- The New Mexico State Legislature responded in 1987 by declaring the need for a state water plan and by assigning the task to the New Mexico Interstate Stream Commission (ISC), a sister agency to the New Mexico Office of the State Engineer (OSE) (NMSA (1978) 72-14-3.1).
- The ISC determined that the way to achieve the state water plan was to divide the state into regions, develop regional water plans, and then assemble those regional plans into a state plan. To aid in the development of regional water plans, in December 1994 the ISC issued the Regional

Water Planning Handbook (Supporting Document H-1) which was written by a group of volunteers and contains required assumptions, general guidelines and, most important, a regional water planning template to provide uniformity in developing regional planning documents. Additionally, the ISC adopted acceptance criteria, which are fully set forth in Supporting Document L.

- Additional impetus to plan came in the early 1990s. For many years experts believed that a virtually inexhaustible aquifer existed under the Albuquerque area. Improved science revealed that the aquifer was dramatically smaller than previously believed, and that water was being drawn from the aquifer faster than it was being replenished. Several studies found that substantially more water was being used than was being renewed. In order to meet the mission of the plan—to balance use with renewable supply—and meet future demands, current usage must shrink (Hawley and Hasse 1992; Thorn, McAda and Kernodle 1993; Kernodle, McAda and Thorn 1995).

1.3 Purpose of This Regional Water Plan

A water plan identifies the available water supply in an area and specifies how this water will be used for the various needs, present and future. This plan seeks ways to attain a balanced water budget guaranteeing that demand does not exceed supply. Regional water planning and this regional water plan document involve answering three basic questions. They are:

- What is the region's water supply?
- What is the region's water demand, now and in the future?
- How will the region undertake to meet demand with supply?

This document details the water plan for the MRG Region of New Mexico. The plan is necessary so that all inhabitants of the region can be assured of having enough water to meet their needs and so that the region can be sure to meet its portion of the downstream compact obligations. It is intended to reflect the diversity of water values present in the region. This regional plan may be used by the State Engineer and the ISC may use the regional plan in the state water plan.

Action is needed to remedy the deficit spending of water. At the same time, however, the region has needs beyond water alone. The stated goals for the water plan point out the vast array of competing interests including, among others, the need to protect the environment, the economy, water quality, agriculture, and desirable lifestyles. An effective plan must carefully balance water remedies among the competing needs.

This plan addresses this need through a wide array of measures ranging from increasing supplies to reducing demand. Taken collectively, these measures are expected to bring about a long-term viable future.

The regional water plan respects the water resource planning efforts of local, tribal, state, and federal entities which are active within the region, and seeks to complement and supplement such planning efforts.

1.3.1 Synopsis of the Water Issues in the Region

Without a water plan this region is vulnerable to overusing its water supply, as in fact it currently is doing. As of 2000 demand exceeded available supply by an estimated average 55,000 acre-feet per year. (The Glossary in Section 1.8 provides definitions for terms used in this document). Up to the present time the MRG Region has been able to obtain the extra water by pumping from aquifers.

As the aquifer and shallow water tables are drained down, other types of problems will intensify the water situation:

- Lowered water table. Draining groundwater has the long-term effect of lowering the shallow water table. When that happens, rivers and streams go dry.
- Land subsidence. When the water beneath a plot of land is drained, the land compacts into the space formerly occupied by the water. It is already apparent in some areas of Albuquerque.

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- Drought. The drought of the first years of the twenty-first century has demonstrated that the region has no drought plan. To date, the region's residents who draw their water from the aquifer have not been severely impacted; but when aquifer water becomes scarce, the region becomes more vulnerable to drought.
- Threat of priority calls. Most municipalities in New Mexico are junior water rights holders. Albuquerque is no exception with regard to some of its water rights holdings. If the State Engineer were to issue a priority call on water rights during a drought, the cities could see much of their water supply turned off.
- Water quality. Water quality issues including purifying water to meet enhanced standards, and the risk of damaging the supplies we are already using by various pollutants, from both industrial and residential sources.

Besides the above, the region is facing a situation where sources of imported water are not easily available. This region is but one part of the desert southwest. The region has thirsty neighbors who, more than not wanting to send water to the region, have indicated designs on importing water from the region.

1.3.2 Mission of the Water Plan

Based upon extensive public input, a statement of the Middle Rio Grande Regional Water Plan's Mission, Goals, and Objectives was developed in 2001 by the Middle Rio Grande Water Assembly (Water Assembly). The Water Resources Board made some revisions which both bodies formally approved as an interim version of mission and goals portions of the document in 2001. The document was revisited and then approved in slightly different versions in July 2003. The complete Mission, Goals and Objectives document (annotated to show the differences) appears as Appendix A. The preamble and mission statement are stated as:

Preamble: The development and implementation of the Regional Water Plan is intended to support policies programs and projects that meet the goals of the plan. Recognizing the limited resource and consistent overuse of the region's water, the following mission and supporting goals are established for the regional water plan.

Mission: Balance Water Use with Renewable Supply.

1.3.3 Goals for the Water Plan

The following goals have been established to support the mission of the MRG regional water planning process:

Goals:

- Ensure that the Mission is fulfilled through fair, open and inclusive public planning and implementation processes.
- Preserve water for a healthy native Rio Grande ecosystem.
- Preserve water for the region's agricultural, cultural, and historical values.
- Preserve water for economic and urban vitality.
- Preserve water for the qualities of life valued by residents in the region.
- Develop broad public and official awareness of water facts and issues, especially the limited nature of water resources.
- Conserve water.
- Promote a system of water laws and processes that support the regional water plan and its implementation.

- Provide appropriate water quality for each use.
- Manage water demand consistent with the stated mission.
- Balance growth with renewable supply (approved by the Water Assembly Action Committee but not by the Water Resources Board).

1.3.4 The Necessity of Collaboration

Water issues in the MRG Region affect diverse urban, rural, and environmental interests. Several goals stipulate that the water plan shall reflect the values of all interests in the region and be based on input from these interests. The Water Assembly has successfully obtained the participation of people with a significant variety of perspectives and expertise, including state agencies, real-estate agents and developers, farmers, journalists, lawyers, economists, hydrologists and other scientists, engineers, environmentalists, and ordinary citizens. The Water Assembly sought the close involvement of native peoples. The native peoples have chosen not to participate, but rather have selected to observe the water planning process. The nature of the collaborative water planning process and institutional water planning issues in the Middle Rio Grande Region is discussed in some detail in John Brown's article, "Whiskey's fer drinkin'; water's fer fightin'!" Is it? Resolving a collective action dilemma in New Mexico (Brown 2003).

1.3.5 State Needs for Regional Water Planning

The MRG Regional Water Plan is expected to become a key ingredient in the state water plan for which the Interstate Stream Commission is responsible. The regional plan bears directly on three separate state responsibilities:

- The Interstate Stream Commission is responsible for assuring that New Mexico meets its interstate compact obligations – receiving water from other states and delivering water to other states. In the case of the MRG Region, the Rio Grande Compact among Colorado, New Mexico, and Texas requires a quantity of water to be delivered across Elephant Butte Dam annually. The Interstate Stream Commission must make sure that the MRG Regional Water Plan recognizes these obligations and takes appropriate steps to help assure that New Mexico does not violate the compact.
- The Office of the State Engineer is regularly called upon to make decisions concerning permission to re-appropriate water use. In making such decisions, the State Engineer is required to make sure that the permission is not contrary to the public welfare of the state. The MRG Regional Water Plan provides the information that defines the public welfare as it applies to this region (Section 10.4).
- The Water Trust Board has been charged with the responsibility for allocating funds from the Water Trust Fund, as well as other funds from the state budget, for water-related projects on a statewide basis. Water Trust Board policy requires that the only projects to be funded will be those that appear in a local capital improvements program on file with the State of New Mexico.

1.3.6 Public Involvement

In the contentious area of water planning, acceptable policy, objectivity, a balance among viewpoints, and a political will must be achieved. Because the only way this may occur is through full public involvement, the Water Assembly conducted an extensive public participation program as detailed in Chapters 3 and 4.

In order to spread the word about water planning, to obtain broad participation, to receive significant input, to make active use of the input, and to keep the public informed, the Water Assembly conducted a program directed toward obtaining public input from the beginning to the end of the planning process.

The program included public meeting events of several kinds conducted throughout the region :

- Roadshows – early presentations on water issues
- Water picture shows – presentations on water situation and water planning

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- Community conversations –each series designed to obtain input on a specific topic: visions and values, goals and objectives, possible remedies, water balancing, alternative actions, candidate scenarios, plan document
- Regional forums – region-wide culminations to community conversation series
- the Water Assembly annual assemblies – annual region-wide session on water planning progress, plans and major issues
- Public opinion surveys– random samples via telephone with questions on various water-related values
- Public comment database – a systematic collection of comments received from the public

1.3.7 Scientific Basis

To be useful and credible, the regional water plan must have a sound scientific basis.

The Water Assembly and the Water Resources Board believe that it is extremely important to base the regional water plan on sound hydrological, legal, and technological data. Toward this end, participants in the Water Assembly have contributed their extensive expertise and various professional services were obtained which directly and indirectly supported the water planning effort.

The professional studies supporting decision-making within this plan include hydrological analyses, meteorological analyses, historical analyses, public opinion surveys, and future projection analyses. The specific main stem studies and their implications are addressed in the supply and demand chapters of this plan (Chapters 6 and 7). Less technical data is known about the Rio Puerco and Rio Jemez subregions (Chapter 12). See Appendix C and Supporting Documents for particularly applicable studies and analyses.

1.3.8 Approaches to Support Specific Local Needs within the Region

The region has many dimensions of diversity: cultural, economic, ethnic, geographic, political, historical, hydrological, etc. Wide differences exist in the perceived needs along each dimension.

Each year a maximum amount of consumable water is provided to the region through rainfall and stream flow. Subject to the constraints of compact and other legal obligations, the region must determine how it collectively wants to allocate make use of that water. This plan provides an overall water budget for the region.

However, within the region there are approximately two-dozen independent local jurisdictions (municipalities, counties, special districts, and pueblos), each with its own specific needs. Through the Water Resources Board, the plan is recommending that the jurisdictions determine a way to ensure that they work together, rather than in opposition to each other. The need is to succeed in implementing the plan so as to meet its stated mission.

This plan reports average water consumption in each of the (non-overlapping) jurisdictions in the region (Section 7.6). It is expected that each jurisdiction will identify, select, and implement the needed ordinances, public policies, and projects that will allow it to decrease its consumptive use of water for the long term, in such a way that the overall collection of jurisdictions does, in fact, balance water use with renewable supply.

1.3.9 Water Planning Entities

The water plan has been developed by a partnership among the Water Assembly, the Water Resources Board, and the Mid-Region Council of Governments (MRCOG)¹ staff. The plan is the result of extensive

¹ On August 9, 2002, the Middle Rio Grande Council of Governments (MRGCOG) changed its name to the Mid-Region Council of Governments (MRCOG).

guidance from the general public. These organizations crafted a Memorandum of Understanding (Supporting Document A-5) and a Roles and Responsibilities Agreement (Supporting Document A-8).

The Middle Rio Grande Water Assembly

At the request of the Office of the State Engineer, the Water Assembly was established with a wide diversity of volunteer constituents in 1997 with the purpose of developing a water plan for the MRG Region through an open, inclusive and participatory process. The Water Assembly Articles of Incorporation and Bylaws appear in Supporting Documents A-1 and A-2.

Working teams, with membership drawn from across the constituency groups, have performed the task-oriented work of organizing the planning process and of building the plan.

Four officers, who are selected at the annual business meeting of the Action Committee, administer the Water Assembly: Chair, Vice Chair, Secretary, and Treasurer.

The remainder of the Water Assembly, as shown in Figure 1-1, includes constituency groups (CG), the Action Committee (AC), the Executive Committee (EC) and the Working Teams (WT).

Constituency Groups

The Water Assembly established five constituency groups. These groups were created to “advocate” the position represented in their title. They met at each annual assembly to select five representatives and five alternates to serve on the Action Committee and to select a chair who became a member of the Water Assembly’s Executive Committee. Each CG also met intermittently throughout the year to discuss the planning process and to provide input from their advocacy position on various issues. The CGs are:

Specialists

Group members include academics, researchers, scientists, data managers, consultants, and agency staff. Their role is to provide feedback on the technical soundness of various planning ideas.

Managers

Members include representatives from firms (public and private), agencies, and jurisdictions responsible for water provision or water management. They provide input as to potential constraints or concerns from a management standpoint.

Environmental Advocates

This group includes citizens who advocate for environmental values in water management.

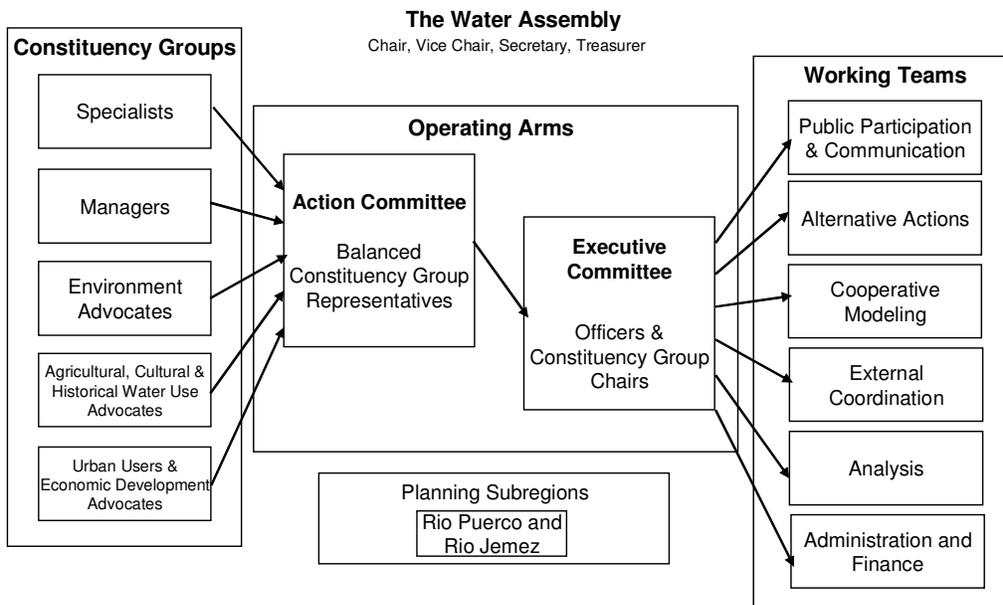
Agricultural, Cultural and Historical Water Use Advocates

These citizens advocate for the values represented in the group name.

Urban Users and Economic Development Advocates

This group is comprised of citizens who advocate for the values represented in the group name.

Figure 1-1 Water Assembly Organization (Source: Middle Rio Grande Water Assembly)



Action Committee

Once a month the representatives from the CGs would meet to bring input from each group into a broader discussion with the “general constituency.” This group of the whole would then make decisions on how to proceed with the planning process.

Executive Committee

Twice each month the Water Assembly Officers and the CG chairs meet to address administrative issues related to the water planning process.

Working Teams

The working teams provide the actual labor for creating the plan. These teams were responsible for completing the various tasks that allowed the planning process to function. Throughout the process there were six permanent WTs and several ad hoc teams. Working team members were drawn from the CGs and from the broader public.

Permanent Working Teams

Public Participation and Communication

This team coordinates public outreach and media relations. They organized and conducted the numerous public meetings held throughout the planning process and created and managed the Water Assembly website. Team members created the informational materials for the public meetings and the newsletters reporting back to the public about the various events and meetings.

Alternative Actions

Members of this working team took all of the public suggestions about alternative actions that could be included in the plan, ensured that the alternatives were analyzed and then synthesized the ideas represented into the 44 alternatives that were used in creating this plan.

Cooperative Modeling

Working with Sandia National Laboratories, this team helped develop the model used to compare and contrast the various alternative actions to determine the impacts on water balance from combinations of these actions. Because the model was integral to the planning effort, this team was structured more intentionally to ensure that it included one representative from each of the other WTs and one from each CG.

External Coordination

This team communicates with regional neighbors up and downstream. Members also coordinate interaction with various water managers, including federal agencies, to keep them apprised of progress on the plan and to receive feedback from these agencies on any potential issues that the plan may need to address.

Analysis

Members of this team are largely technical experts who were “on call” to respond to technical questions from other WTs.

Administration and Finance

As the name states, this team manages the administrative functions and handles the budget for the Water Assembly activities.

Temporary Teams

Scenario Development Committees

As the planning process matured, the Water Assembly created five Scenario Development Committees (SDC) who were charged with using the computer model to combine various alternative actions into scenarios that could become the basis for the plan. Members from each CG were distributed among the SDCs. The SDCs created scenarios reflecting an environmental view, an agricultural/historical view, and an urban view. Additionally there was a synthesis view and a scenario called Water for the Future created by a committee that chose to not use the computer model. The five scenarios were then “converged” into one scenario, which became the framework for this plan.

Public Welfare Group

Expressing regional values was a goal for the Public Welfare Group. Members met for one month on the very focused task of drafting a public welfare statement to be included in the plan (Section 10.4). The idea is that decision-makers can use this statement as a guide to public values when they are making any water-related decision, including transferring water rights.

Recommendations Committee

This group had the responsibility for drafting recommendations that will allow the converged scenario to become our actual water future. The recommendations were based on legal, scientific and publicly supported concepts (Chapter 10).

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Subregions

At the same time that the main plan was being developed, the Rio Puerco and Rio Jemez subregions developed a separate water management plan through a joint powers agreement between MRCOG, the Cuba Soil and Water Conservation District and the subregional steering committees (Chapter 12). While this was an independent effort, the subregional plan is consistent with the regional plan.

The Placitas area, offset from the mainstem Rio Grande, has conducted three community water planning workshops and performed a current/historical water demand study. These efforts were designed to lead to a subregional water plan as identified in a Memorandum of Understanding with the Water Assembly. The reports of these efforts appear in Supporting Document S.

The Mid-Region Council of Governments

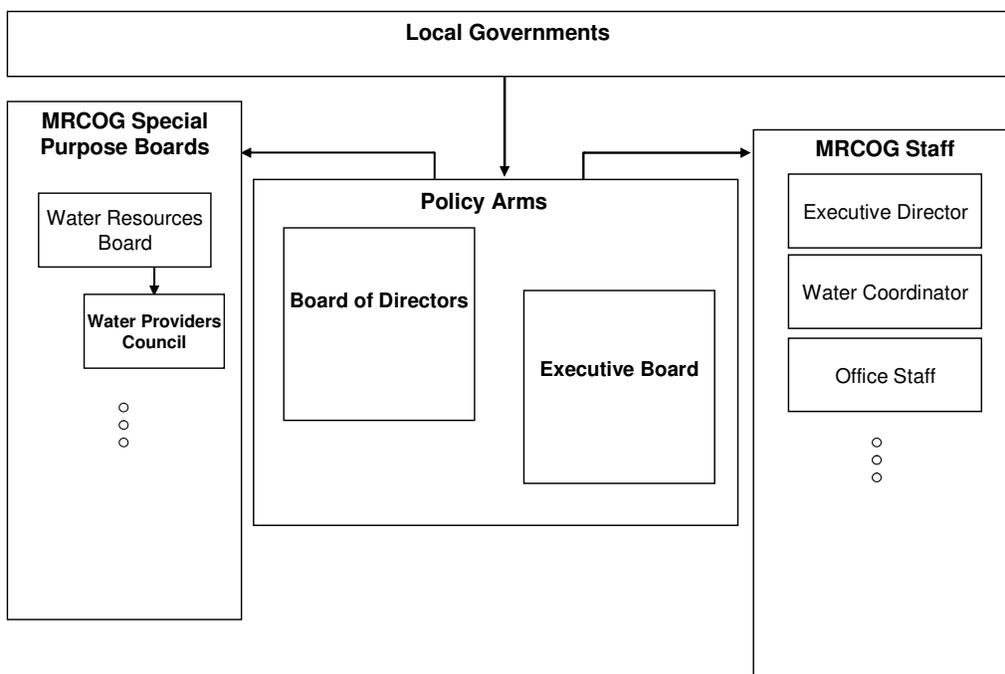
MRCOG is a governmental agency, which takes a regional approach to urban and rural planning in central New Mexico. MRCOG's mission is to strengthen individual communities by identifying and initiating regional planning strategies through open dialogue and collaboration between member governments.

As Figure 1-2 shows, MRCOG's structure includes special purpose boards, which have specific planning tasks. Pertinent to this plan is the Water Resources Board and its Water Providers Council.

The Water Resources Board was established in 1998 to provide a decision-making process for regional water issues. The Water Resources Board is responsible for preparing, coordinating, and adopting a regional water plan and for working with other regional water planning organizations such as the Middle Rio Grande Water Assembly.

Eligible members to the Water Resources Board include 15 governmental entities that have jurisdiction and authority in water planning and management in the region, six tribal governments, and three ex-officio members.

Figure 1-2 Mid-Region Council Of Governments Organization (Source: Middle Rio Grande Water Assembly)



Within the Water Resources Board a Water Providers Council was established to ensure that water rights were protected and appropriately utilized. Decisions within the Water Providers Council use a weighted voting procedure based on the nature and extent of water rights held by each of its members. That is, those with senior water rights have more influence in decision-making.

Working Together

Based on the December 1998 Memorandum of Understanding (Supporting Document A-5), the Water Assembly and the MRCOG committed to work together to create the regional water plan. The Water Assembly has responsibility for preparing the regional water plan and MRCOG has a responsibility to adopt and implement the plan.

To coordinate their efforts, the Water Resources Board and the Water Assembly Action Committee held joint meetings. In January 2001 the joint meeting produced the annotated table of contents outlining what the plan should cover and in 2003 they met several times to reach consensus on what the final plan should include.

1.3.10 Guiding Process Principles

The developers of the plan realized early in the process that no one in the region had a balanced viewpoint about how to deal with water. Rather, only a broad collection of people from widely varied backgrounds could weigh all relevant factors judiciously. Because of the intensity of actions that would be needed to actually solve our impending problems, they were similarly convinced that no plan would be politically implemented without a broad constituency basis. Further, because of the complexity of the region and its hydrology, the developers recognized the necessity of gathering extensive, detailed technical data as a basis for their decisions.

Accordingly, one fundamental principle in the development process was to have a highly informed public involved from the very beginning of the planning process, rather than simply trying to get the public to approve a planning product at the end of the process.

This plan, built through an open, inclusive, and participatory process, blends public values and preferences with sound technical analyses of the region's water situation and of the implications of candidate remedial actions and scenarios.

1.3.11 Use of Historical Information to Help Ensure a Valid Planning Process

The regional water plan has been developed to help make decisions for the future. In order to do this well, it was essential to make the best use of historical data, consider the reasonableness of extending that data into future predictions, and then make decisions accordingly.

At the same time, it is often not possible to obtain all of the data that would be desirable. Furthermore, measuring devices have varied limits upon their accuracy and precision.

Partially from lack of resources and partially because of the wealth of information that had been developed for the region by external sources, it was obvious that the planning process would require the use of technical information from many different historical sources along with information that was developed specifically for the plan.

Since the available data were developed from different sources, at different times, with different methods, using different tools and assumptions, and for different purposes, they contained similar but somewhat different numerical results. However, within the limits of accuracy and assumptions, the many studies' basic results were similar, and sufficiently so to justify basing decisions upon.

1.3.12 Guidance for Implementation Across Numerous Jurisdictions

Authority for managing water in New Mexico is impressively diffuse. Federal agencies, tribes, state agencies, special districts, local governments, and individual water rights holders all possess some level of authority. This regional plan provides specific guidance and implementation tools to help the authority

holders to take the actions needed to achieve a coordinated result, namely protecting the region's collective future by balancing water use with renewable supply (Section 5.12).

1.4 Context Within New Mexico Water Planning

1.4.1 The Impetus to Plan

In the early 1980s, the City of El Paso filed for permits to drill wells in New Mexico. The State Engineer denied El Paso. El Paso sued and in 1984 won in Federal District Court based on a 1982 Supreme Court decision (City of El Paso v. Reynolds 1983; Sporhase v. Nebraska 1982). The Supreme Court ruled that water was a "product" subject to interstate commerce laws. As such, states could not restrict the flow of products nor give preference to instate buyers.

Even though El Paso's request was eventually denied on a technicality, the New Mexico State Engineer recognized that New Mexico needed to do something to protect its water supply. The Supreme Court had raised the possibility that if a state could show that selling water out of state would pose an infringement on the public welfare, it might be able to restrict such sale.

In 1987 the State Legislature enacted legislation providing for a study committee to develop a plan to prevent future sales of water out of the state (NMSA (1978) 72-14-43; NMSA (1978) 72-14-44). Due to the diversity of conditions in various parts of the state, the committee issued a recommendation to create regional water plans for each region of the state. The water plans would detail supply, demand, future demand, and a description of the public welfare issues for that region. Although a state water plan was not specifically provided for at the time, the legislature has since appropriated money for a state plan. The regional plans will most likely be integrated into an overall state water plan. The committee also recommended that the state begin purchasing any unappropriated water rights and holding them in reserve for future needs.

1.4.2 Defining the Region

Once regional water planning was approved, regions were defined partly according to hydrological areas such as the Albuquerque basin or the Rio Grande, and partly according to shared political and economic interests. Regions were self-defined. Areas could designate themselves a region if the residents believed they had common water issues. Currently there are 16 water regions.

Originally the MRG Region defined itself as including Sandoval, Bernalillo, Valencia, and a small portion of Torrance, Socorro, and Sierra counties. This area extended from the Otowi gauge near Cochiti Pueblo to Elephant Butte dam. Figure 1-3 is a map of the region. Early in the planning process, Socorro and Sierra counties formed a separate region because they perceived their situation to be quite different from their urban neighbors to the north.

In addition to the Rio Grande main stem basin, the MRG Region contains subregions. They are the Rio Puerco basin and the Rio Jemez basin. Each has traditionally provided a certain amount of inflow to the Rio Grande, but otherwise is hydrologically separate. The two subregions have been the beneficiaries of substantially less scientific study than has the main stem of the Rio Grande. The residents of the two subregions have been working together on, and have developed, their own component of this regional water plan.

The subregional water plan for the Rio Puerco and the Rio Jemez has been confirmed not to be in conflict with the plan for the main stem of the Rio Grande. That subregional plan is presented as Chapter 12 of this document.

1.4.3 Organizing for Public Participation and Implementation

After the initial legislation on regional water planning was passed, MRCOG (at that time Middle Rio Grande Council of Governments) created a report on water resources in the region (MRGCOG January 1991; MRGCOG July 1991; MRGCOG 1992; MRGCOG June 1993a; MRGCOG June 1993b). However, no further planning took place. Near the end of 1996 interested parties, including Norm Gaume, Frank

Titus, Steve Hansen, and John Shomaker began to campaign for an active planning process. They prompted State Engineer Tom Turney to approach University of New Mexico (UNM) President Richard Peck to take the lead in initiating the planning process.

UNM organized a conference on water planning in August 1997. Of the 350 attendees, 349 voted to support creation of a plan. The university committee was asked to propose a structure for a water planning organization.

At a second conference held in late 1997, an action committee took responsibility for forming the organization which came to be known as the Water Assembly. One of the first decisions concerned how to fund the organization. After considering several options, including self-funding or becoming an associate of a New Mexico university, MRCOG was asked to be the fiscal agent for the plan.

For its part, in December 1998 the MRCOG created the Middle Rio Grande Water Resources Board, composed of delegates from member organizations of the MRCOG, including elected officials and their appointees. The Water Resources Board is the partner organization with the Water Assembly with authority to adopt and implement the plan.

Funding the Planning Process

The planners obtained funding from several sources in two phases.

- Phase I - Phase I of the plan development process began July 1, 1999. The MRCOG obtained \$150,000 appropriated by the State legislature to the ISC for planning activities. Local governments contributed \$161,353 to the process. Phase I ended in early 2002 with the publication of the report Future Water Use Projections for the Middle Rio Grande Region (MRGCOG 2001). Refer to Appendix C-4 for the executive summary of this report. Historical Archive A-1 provides contract language and Supporting Document A-8 provides the roles and responsibilities letter.
- Phase II - In 2001, the state legislature appropriated funds for regional water planning and the ISC allocated the funds among the water planning regions. From April through September 2001, the Water Assembly, the MRCOG, the Water Resources Board and the ISC negotiated a Phase II contract providing for completion of the regional water plan. Authorization to proceed was given on March 12, 2002. Resources were identified from ISC funds (25%), local government funds (25% or \$280,530) and volunteer in-kind resources (50%). This contract divided the participation in the program among the Water Assembly, the MRCOG, and the Water Resources Board, as established through the partnership Memorandum of Understanding and the October 2000 roles and responsibilities agreement. (See Historical Archive A-2 and Supporting Documents A-5 and A-8).

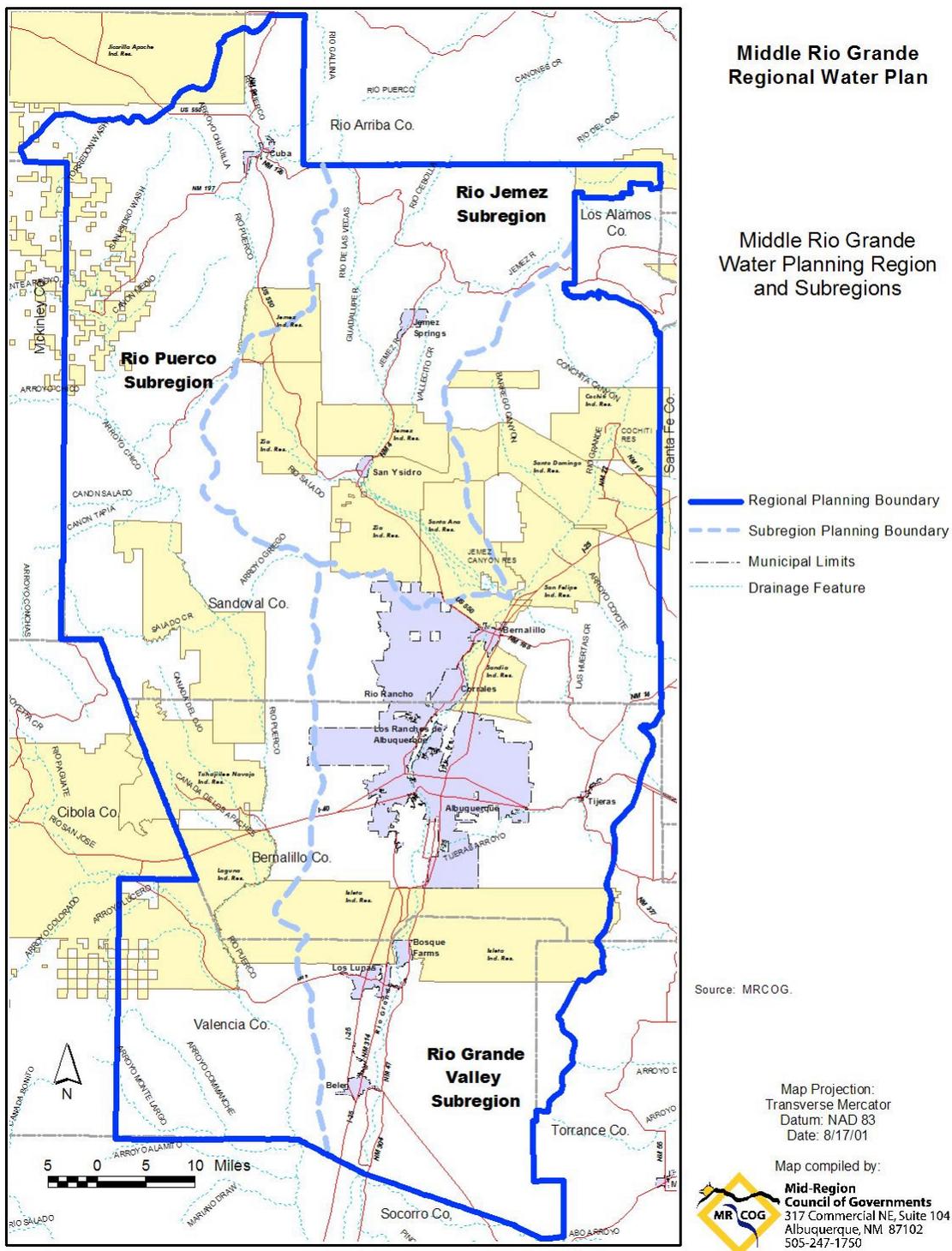
Defining Mission, Goals, and Objectives

During 2000, the Water Assembly through general public meetings developed a statement of mission and goals in collaboration with the Water Resources Board. A set of objectives was also proposed, although it was not made final until mid-2003 (Appendix A). This was a key step to developing a common understanding of what the water plan development process would look like.

Obtaining Participation

In keeping with its mission to facilitate an open, inclusive, and participatory process, the Water Assembly has actively sought participation of all stakeholders. Original members of the Water Assembly came primarily from three groups: urban residential water users, agricultural water users, and environmental advocates. In early 2000 Albuquerque Mayor Jim Baca indicated that the participation of the business community and real estate developers would also be needed. Since that time business members have played an active role in the Water Assembly processes. The Water Assembly also invited another key stakeholder in the region, the Native American peoples, to participate. However, primarily due to concerns about jeopardizing their prior and paramount water rights, the Native American peoples have opted to be observers only.

Figure 1-3 Middle Rio Grande Water Planning Region and Subregions (Source: Mid-Region Council of Governments)



Collecting and Publishing Water Data

The Water Assembly faced a huge task of obtaining and evaluating accurate data on water supply and demand in the region. They published the Middle Rio Grande Water Budget in October 1999 (Appendix B). The budget is the “wet” water supply and demand over a 25-year period from 1972-1997 in the area between the Otowi gauge and Elephant Butte dam. The Water Assembly requested, and the MRCOG used ISC funds for, a study of water use titled Historical and Current Water Use in the Middle Rio Grande Region (Nims et al. 2000). In addition the ISC and the U. S. Army Corps of Engineers funded the Middle Rio Grande Water Supply Study (S.S. Papadopoulos & Associates 2000). The studies each summarize existing available research on the topics in single comprehensive documents. Refer to Appendices C-6 and C-7 for executive summaries of these reports.

Future Water Demand

The MRCOG produced a study titled Future Water Use Projections for the Middle Rio Grande Planning Region (MRGCOG 2001). Refer to Appendix C-4 for the executive summary of this report. This report was based upon the general assumption that no change would be made to public policies over the next fifty years. Specifically, it took selected historical data, population projections, and assumptions about behavior in various sectors. It also assumed that all the water the region might ever need was available at reasonable cost. The report predicts that by year 2050, the annual 55,000 acre-foot deficit would grow to an annual 150,000 acre-feet.

Public Opinion

Using ISC funds, MRCOG contracted with the UNM Institute for Public Policy to conduct a survey of statewide public opinion on water issues, with special sampling within the MRG Region (Institute for Public Policy 2000). The results of this survey were combined with the results of community conversations, regional forums, and with other data in establishing an understanding of public preferences and values within the region. Appendix C-5 contains a summary of the report.

Water Balancing

In early 2002, the Water Assembly conducted an exercise to determine where water use should be cut in order to balance the water budget. Using a computer-based graphic spreadsheet tool several similar but non-identical prorations of water among sectors were developed for later use in developing scenarios.

Identifying Alternative Actions

One of the key components of water planning is identifying water management actions that can be taken to remedy any difference between supply and demand. Toward this end, the Water Assembly collected 273 suggestions from public meetings and technical personnel. These suggestions were blended and refined into a set of 44 categorized candidate alternative actions.

Appraising the Actions

From September 2002 through early 2003 the Water Assembly elicited informed public opinion to determine which of those alternative actions would be acceptable to the community. Water experts made a preliminary analysis of each action. Approximately twenty attributes were evaluated for each action. Attributes include, for example, cost, water impact, physical/environmental effects, economic implications, social/cultural impacts, and legal considerations. A more in-depth analysis of the actions, 25 by a professional firm under contract with the MRCOG, and the remaining 19 by the Water Assembly volunteers followed this. These analyses were presented to the public in community conversations and a regional forum so as to obtain the needed informed preferences. A professional contractor performed special analyses of water quality issues and of legal issues in the region. Approximately concurrent with the analyses and presentations, another public opinion survey was conducted.

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Packaging the Actions

A scenario consists of a collection of actions, each action quantified as to its level of implementation. Such a collection is called a scenario. Draft alternative scenarios were developed based upon the technical evaluations of the actions, the expressed public preferences, and water balancing exercise data. Each draft scenario was slanted toward a constituency viewpoint but was developed by a mixed group of individuals, each advocating a different constituent position. A computer-generated model was specially developed to aid in understanding the implications of the choices in the selection of alternative actions. Through another series of community conversations and a regional forum, along with further technical analyses by an independent hydrological consulting company, the Water Assembly with the Water Resources Board, blended the draft scenarios into a single preferred scenario. This scenario, in turn, forms the basis for the plan's recommendations.

The Water Plan Document

All of the ingredients that had been developed over the years have been assembled into the plan document with incremental deliveries, using the preferred scenario as the basis for recommendations. These document segments have been reviewed and critiqued extensively by the Water Assembly working teams, the Water Assembly Executive Committee, the Water Assembly Action Committee, MRCOG staff, the Water Resources Board, and the general public. Public review sessions will be held in January 2004 in parallel with that review, critique, and approval process, the regional water plan document is to be reviewed and accepted by local government jurisdictions in the planning region.

1.5 Mechanism for Providing Comment

Review and comment on this document took place in multiple stages and in incremental levels from paragraphs through chapters to multiple chapters. Depending upon the particular chapter, an assigned working team performed an informal critique of the author's product. After that review and revision each segment was placed on the Water Assembly web site for an "internal" review and critique by the Water Assembly Action Committee, the Water Resources Board, and the MRCOG.

When appropriate to issue an incremental version to the general public for review, the block of material for the version (groups of chapters, sections and paragraphs) was made available to the Water Assembly Executive Committee as a final check for significant errors. The version was then placed on the Water Assembly website for review and critique by the general public.

In each instance, except for the informal author review, comments were formally tracked in a database. Comments were reviewed to decide which working team would be appropriate for acting upon the possible update. Resultant revisions were returned to later versions of the plan. Accepting entities will be requested to adopt a resolution by their governing bodies accepting the plan.

It is anticipated that this plan will be subject to an ongoing or periodic update process after delivery to the ISC. Comments from the general public can be sent directly from the website by e-mail. Comments may also be e-mailed from anywhere to comments@mrgcog.org. Comments may be mailed via USPS to:

Water Planning Coordinator
Mid-Region Council of Governments
317 Commercial, NE, Suite 104
Albuquerque, New Mexico 87102

or to:

Water Plan Comments
Middle Rio Grande the Water Assembly
P. O. Box 25862
Albuquerque, New Mexico 87125

1.6 Previous Water Planning in the Region

The MRCOG received a water-planning grant from the ISC in 1989 and subsequently produced a four-volume set of reports on the regional water planning process with the final volume being released in 1993 (MRGCOG January 1991; MRGCOG July 1991; MRGCOG 1992; MRGCOG June 1993a). These reports were intended to provide a foundation for the eventual development of a regional water plan.

These planning reports came out before the regional water-planning template was developed by the ISC and a water plan was not a product of this earlier work. However, a combination of reports released in the early 1990s from the U.S. Geological Survey and New Mexico Tech revealed new data that indicated a significantly reduced volume of water available in what was then called the Albuquerque-Belen Basin (Hawley and Hasse 1992; Thorn, McAda and Kernodle 1993; Kernodle, McAda and Thorn 1995). The water assessment that had been published in the MRCOG reports had been based on available data at that time but was essentially discredited by the new studies. Also, MRCOG received an Environmental Protection Agency (EPA) grant under Section 502(j) of the Federal Clean Water Act in 1990 to develop a regional water quality management program. With that EPA grant, MRCOG published several reports, Regional Water Quality Management - Volumes I and II (MRGCOG January 1991; MRGCOG July 1991) and the Student Factbook on Water Resources in the Middle Rio Grande Area (MRGCOG October 1991).

Subsequent to those regional water-planning reports, the MRCOG redirected water-planning activities to local government technical assistance using many of the recommendations from the regional reports. Local water planning involved the adoption of various water conservation and management regulations and ordinances to protect local water resources. The State Engineer's call for a water plan in the Middle Rio Grande in 1996 was the catalyst for the current regional water planning effort. The city of Albuquerque, U.S. Bureau of Reclamation, State Engineer's Office (OSE), and UNM were instrumental in pushing forward with the development of a regional water plan for this area. The formation of the Water Assembly evolved around this time.

Previous water planning documents within the region include the following:

City of Albuquerque. City of Albuquerque Water Resource Management Strategy. Prepared by the Albuquerque Public Works Department. May 1997.

City of Albuquerque. City of Albuquerque Water Resource Management Strategy, Evaluation of Alternatives and Strategy Formulation. Prepared by CH2Mhill for the Albuquerque Public Works Department. February 1997.

U.S. Bureau of Reclamation. Middle Rio Grande Water Assessment, Final Report. Prepared by Albuquerque Area Office. 1997.

Middle Rio Grande Conservancy District (MRGCD). Middle Rio Grande Conservancy District Water Policies Plan. Prepared by C.T. Dumars, M. Jofuku, S.C. Nunn, R.G. Cummings, D. Moffit, J. Shomaker, J. Watson, M.B. McDonald. 1993.

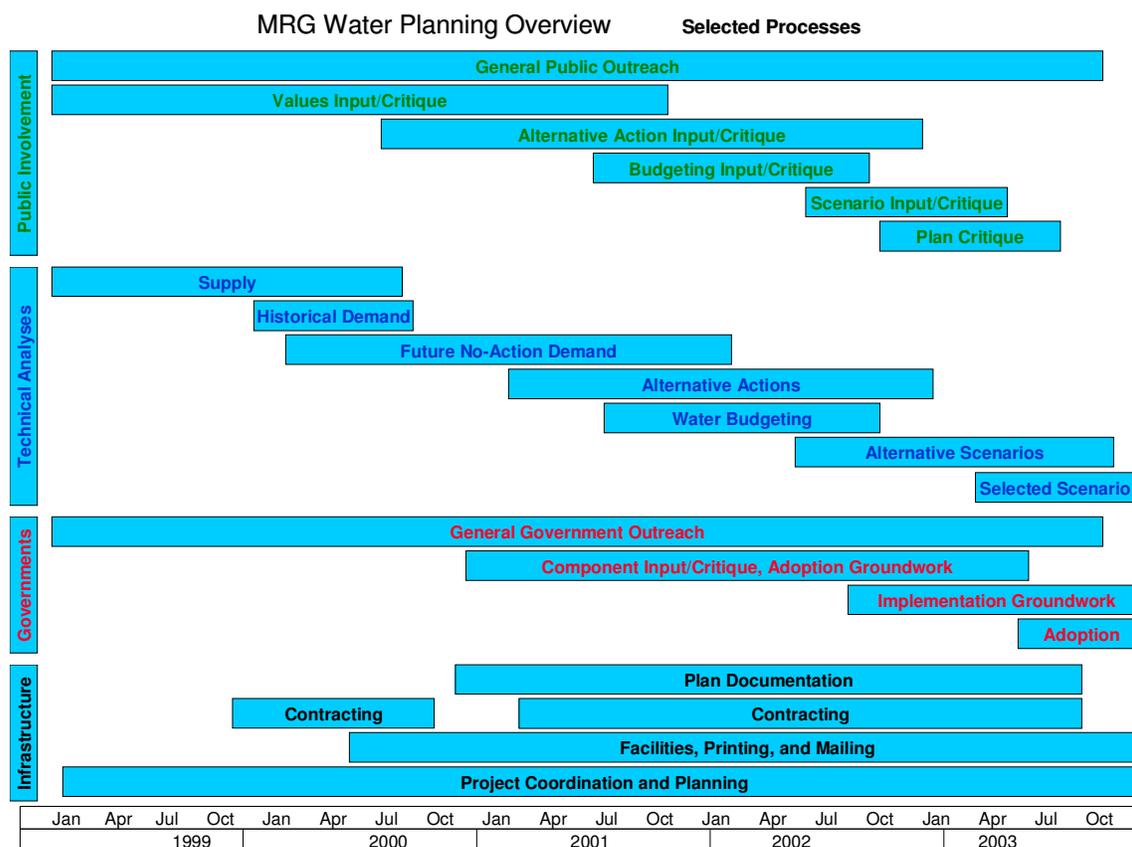
This document updates some components of the Official Plan of 1928 (below) and includes some history of water management in the Middle Rio Grande Valley

Middle Rio Grande Council of Governments (MRGCOG). The Survey of Water Resources Issues in State Planning and Development District 3. Prepared by MRGCOG with funding assistance provided by State of New Mexico, Dept. of Finance and Administration, Local Government Division. July 1989.

Middle Rio Grande Conservancy District (MRGCD). The Official Plan: Report of the Chief Engineer J.L. Burkholder. August 15, 1928.

Submitting a plan for flood control, drainage, and irrigation of the Middle Rio Grande Conservancy District. Three volumes. This is the first complete description of all elements of the Middle Rio Grande Conservancy District.

Figure 1-4 MRG Water Planning Overview Schedule (Source: Middle Rio Grande Water Assembly)



1.7 Project Timetable

In order to assure timely completion of Phase II in the development of the plan, the Water Assembly prepared a project schedule. The chart depicts the start date and completion date of the important tasks to be accomplished in graphic form. The chart has been revised as changed conditions or situations have been identified. A major revision to the chart took place in February 2003 when the ISC extended the date for its receipt of the draft final water plan. A summary chart for the overall program appears as Figure 1-4. The project schedules (before and after schedule revision) appear in Supporting Document B.

1.8 Glossary

For the reader's convenience, several key terms used in this document and pertaining to this region are defined here. A more thorough glossary is available in Appendix D.

- Acre-foot** Volume of water required to cover 1 acre of land (43,560 square feet) to a depth of 1 foot; equivalent to 325,851 gallons.
- Aquifer** A geological zone (e.g., a group of strata) in the subsurface that is saturated (i.e., is below the "water table") and is sufficiently permeable to yield useful quantities of groundwater to wells. See also "Deep Aquifer" and "Shallow Aquifer."
- Consumption** In water-resource jargon, water is used consumptively when it is evaporated or transpired, and thereby lost completely from the system.

Deep Aquifer	The saturated, potentially water-yielding part of the older basin-fill sediments that geologists-call the Santa Fe Group. The deep aquifer is the primary water source for most municipal, industrial, and many private domestic users. It is in direct hydraulic connection with the shallow aquifer, which rests on it along the river floodplain. The water table in the deep aquifer is locally as much as 1,000 feet below land surface.
Depletion	Normally synonymous with consumption. The Water Budget document defines it as the net reduction in surface water flow between two specified points in the flow system in a given time interval (i.e. day, season). Middle Rio Grande depletion is calculated as follows: native-water inflow at Otowi, minus outflow at Elephant Butte Dam, plus or minus changes in reservoir storage. (Note that all inflows and outflows occurring <i>within</i> the boundaries of the Middle Rio Grande are ignored in the equation.)
Diversion	A turning aside or alteration of the natural course of a flow of water, normally considered physically to leave the natural surface channel or aquifer.
Evapotranspiration (ET)	The combined processes of simple evaporation and plant transpiration through which liquid water is converted to water vapor or plant tissue and lost from the water system.
Forbearance	A process whereby a farmer can choose for a short period of time not to make use of his or her senior water right, thus enabling another entity to make use of that water.
Native Water	Water originating in the Rio Grande drainage.
Paper Water	A term that whimsically identifies water <i>rights</i> owned or claimed within a system. Compare with “Wet Water,” which identifies the <i>actual</i> water within the system.
Phreatophyte	A plant that habitually obtains its water supply from the zone of saturation, either directly or through the capillary fringe.
Recharge	The general process of water being added to a groundwater reservoir. The process includes infiltration from surface water, downward percolation from soil water, and subsurface percolation from adjacent aquifers.
Riparian	The environment adjacent to streams and rivers wherein water is more abundant, and especially the flora occupying this environment.
San Juan-Chama Project	A system of diversion structures and tunnels for trans-mountain movement of water from the San Juan River Basin to the Rio Grande Basin. The primary purpose of the San Juan-Chama Project is to provide a supplementary water supply to the middle Rio Grande Valley for municipal, domestic, and industrial uses. The project takes water from the Navajo, Little Navajo, and Blanco Rivers, which are upper tributaries to the San Juan River. The Blanco Diversion Dam diverts water to the Little Navajo River. Little Oso Siphon carries water from the Little Navajo River to Oso tunnel. The Oso Diversion Dam diverts water to the Navajo River. The Azotea Tunnel conveys water 13 miles from the Navajo River to Azotea Creek. The imported water flows down Azotea and Willow Creeks 12 miles to Heron Reservoir.

Following a feasibility study of a diversion from the San Juan River to the Rio Grande Basin conducted by the Bureau of Reclamation, Congress authorized the San Juan-Chama Diversion Project in 1962. Construction of the various diversion projects began in 1964 and was largely completed by 1971. The San Juan-Chama Project provides an annual average diversion of

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110,000 acre-feet of water per year. Albuquerque owns 48,200 acre-feet per year of this water. The water must be put to beneficial use under the terms of the interstate compacts and federal law. For further details concerning the City of Albuquerque's permit application, see <http://www.usbr.gov/dataweb/html/sjuanchama.html>.

Shallow Aquifer

This is the saturated part of the geologically "Recent" alluvium--those river-borne deposits 60-100 feet thick that underlie the Rio Grande floodplain. It is hydraulically interconnected with the surface-water system (river and drainage ditches), and also it is interconnected with the deep aquifer. Because of its shallow water table, it supplies water to vegetative evapotranspiration in the valley.

Water Budget

A summary that shows the balance in a hydrologic system between water supplies (inflow) to the system and water losses (outflow) from the system. It is a common reporting tool for water-resource systems.

Water Table

The surface designating the top of the zone of saturated strata in the subsurface. Below the water table all pore spaces among sediment grains, and all fractures in the geological materials are water filled.

Wet Water

The actual water in a water-resource system; as opposed to "paper water," which is a term used for water *rights* owned or claimed within the system.

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