

10

Recommendations

These quotes from the Office of the State Engineer and Interstate Stream Commission's strategic plan articulate key constraints to this plan's recommendations.

The flows of New Mexico's two major rivers—the Rio Grande and the Pecos River—are barely adequate to meet both New Mexico's existing needs and its interstate stream compact delivery obligations. The state's continuing ability to meet those compact obligations is a delicate balance. (OSE/ISC 2003)

Management - New Mexico must efficiently and effectively manage its rivers and groundwater to maximize the use of the state's water supply to meet existing water rights, to meet any required environmental demands, and to meet its interstate stream compact obligations. (OSE/ISC 2001)

In accordance with the mission of the Middle Rio Grande Region's (MRG Region) water plan to balance use with renewable supply, and keeping in mind the state's role and mission as well, this chapter contains the recommendations that follow from the Preferred Scenario. The following sections are included:

- Introduction—Presents some basic assumptions relating to the detailed recommendations.
- Detailed Recommendations—The recommendations are generally grouped to match the sequence of topics addressed in the Preferred Scenario description of Section 9.3. The reader should not infer any indication of priority, urgency, or importance from the sequence that the items are listed in this section. In addition, a few recommendations appear that are needed to meet the mission and goals (see Appendix A) but are not directly implied by the Preferred Scenario.
- List of Water Projects
- Statement of Public Welfare for the Region

A table of the benefits and costs with projected timing for all of the recommendations discussed in Section 10.2 will be developed during updates of the plan during 2004. More information relevant to these recommendations can be found in the Fact Sheets prepared by Daniel B. Stephens and Associates and the analysis of 19 alternatives that the Alternatives Working Team prepared (see Supporting Documents Series G and Supporting Document J). For definition of terms, see the glossary in Section 1.8.

10.1 Introduction

The Preferred Scenario of Section 9.3, the alternative actions, the original suggestions that led to the alternative actions, the analysis reports by D. B. Stephens and Associates, and the analyses that are embedded in the Sandia National Laboratory's Middle Rio Grande model (MRG model) of the region and of the alternative actions were used as source data for the recommendations.

10.1.1 Vision and Assumptions

Regional Inflows and Rainfall

Assumptions concerning the inflows and precipitation for the planning period are described more extensively in Section 9.3.1. In summary, two predictions are considered: The "recent historical prediction" is based upon the average inflows and precipitation for the last half of the twentieth century. The "tree ring prediction" average is about 94% of the "recent historical prediction" average. For drought planning, a ten-year period was used with inflows about 89% of the above two prediction levels.

Population Projections

Assumptions concerning population growth for the planning period are described more extensively in Section 9.3.1. In summary, population growth was modeled to match the estimates from the UNM Bureau of Business and Economic Research (BBER 2002).

Imported San Juan-Chama Project Water

Assumptions concerning the use of the imported San Juan–Chama Project water are discussed more extensively in Section 9.3.1. In summary, it was assumed that the entire contracted amounts (after transit losses) will be available, will come into the region, and will be diverted to the contractors starting in 2006. It is understood that even though the plan assumes the full San Juan–Chama Project allotment, there is a possibility that it will not be received every year.

10.1.2 Urgent Shortfall Reality

“The Key Fact About Our Water - Demand Exceeds Supply” (OSE/ISC 2002)

The initial implementation schedule for the Preferred Scenario may leave a Rio Grande Compact delivery shortfall for ten to twenty years. We need to accelerate implementation of the water planning actions. We need to eliminate the predicted short-term deficits in our compliance with the Rio Grande Compact until the other measures in this plan have had time to take effect. All users must share in the substantial contributions to the effort. The state and the region should work openly and cooperatively to address this issue. Specific urgent actions should be identified, studied, evaluated, and implemented that are focused on avoiding defaulting on the Rio Grande Compact. These actions will have urban and rural economic impacts, but such impacts should be temporary. **Unless there is a priority call, w**Water-rights holders must be fairly compensated for the temporary loss of use rights when water is reallocated to meet compact delivery requirements.

All necessary actions should be taken to ensure that water necessary to meet the shortfall is acquired. In doing so, the acquisition of water should not be limited to any one primary source or sector.

Considerations in achieving a balanced plan of action should include accelerated Bosque and riparian restoration, a method for performing priority administration in advance of adjudication, a residential conservation program, a municipal and industrial conservation program, an agricultural conservation program, reduction in urban pumping, state leasing of urban water, state leasing of agricultural water, increase in upstream instead of downstream storage of water, and a moratorium on new authorizations of consumptive use.

10.1.3 Need for Balanced Decisions During Water Shortages

With the advent of ground-water pumping, consumptive uses have been temporarily insulated from the effects of water shortage. We now know that surface and ground water are linked, each affecting the other. No one usage should be insulated from water shortages. In balancing decisions during water shortages, additional considerations should include senior rights priorities, and the ability of each individual to absorb additional conservation while recognizing historic uses and community values.

10.2 Detailed Recommendations

The increase in demand for water is an ongoing phenomenon. This section recommends specific actions to meet the region’s future demands. Local governments, water management agencies and water users should implement these in order to align with this plan’s goals and objectives. Table 10-1 identifies how each recommendation supports the mission and goals of the plan. Table 10-2 lists the numeric performance targets that appear explicitly in the Preferred Scenario of Section 9.3.

These recommendations were derived from Chapter 8’s individual alternative actions, Chapter 9’s Preferred Scenario and can be traced back to suggestions from the public as well as experts in their respective fields. The implications of this section have been taken from technical analysis, modeling and the judgment of various participants in the process.

Some of the main impediments to good conjunctive-use management are: junior ground-water rights that intercept and draw the flow of ground water away from nearby rivers, thereby impairing older surface-water rights; uncontrolled domestic well development in some local high density areas; inability to strictly apply the priority system; and woefully inadequate requirements for metering and reporting water diversions.

This plan recommends strengthening conjunctive-use management by encouraging the state legislature to define state water management aims and by directly addressing aspects of New Mexico water law that now prevent conjunctive management of our ground and surface waters. What is needed at the most fundamental level are four things. First, the state should decide the fate of the priority system — ~~and including whether and~~ how it should be modified. Second, the state should decide how to make the management of ground water and surface-water rights mutually consistent, and consistent with how water-right priorities are to apply. Third, it should decide what transitional adjustments will be needed to phase in any changes in a fair and equitable manner from our present unbalanced system. Fourth, it should provide clear guidance to its water officers, especially the State Engineer, on the philosophy and principles that are to govern administration of this state's water affairs.

R2-3—Funding Source for Water Activities (A-59, A-58)

In order to have a reliable funding source for water projects, planning and conservation, a dedicated and reliable recurring revenue stream augmented with federal funds needs to be established. The state is seen as the most appropriate level of authority to impose such a revenue source and to manage the proceeds for the benefit of the state and for the region.

R2-4—Elephant Butte Loss Accounting (A-51)

The Office of the State Engineer and Interstate Stream Commission (ISC) should assure that evaporative losses from Elephant Butte Reservoir are apportioned fairly between the two water-planning regions, Socorro-Sierra and Middle Rio Grande. ~~Spring 2004 information from the ISC indicates that the compact has already apportioned the waters of the basin; evaporative losses are considered neither an asset nor a liability. Therefore, this does not seem to be a viable option.~~

R2-5—Active Administration (A-143)

The plan encourages active administration by ISC. The State Engineer should establish an improved enforcement program to ensure that only the necessary and allowable water is drawn for municipal uses, agriculture, and other uses.

In addition, the region is increasing its draw upon water by transferring the rights from one point to another, and then continuing to consume water at the location from which the water rights were transferred. It is recommended that a program be instituted for enforcing water retirements after transfers (both permanent and temporary). It is particularly important that land whose water rights have been retired, transferred or leased not continue to use part or all wet water for which it had been previously entitled.

R2-6—Water Resource Database (A-73)

A regional water resource database needs to be established and maintained within the region and made accessible to ~~all interested parties~~any water management entity. This regional data and information can be available as a basis for historical trend analysis, current conditions profile, and future projections of water supply and demand. Currently, the data applicable to this region is maintained by a number of agencies and may not be suitable for centralized accumulation and storage. It is recommended that a regional compilation of data could be achieved through a cooperative networking process with a directory of source locations and other necessary references for retrieving the data.

Technical studies calculating inflows, consumptive uses, and interaction between ground water and surface water in the region still contain uncertainties. While within reasonable ranges of each other, different studies yield somewhat different numbers. It is also recommended that further studies be conducted to enhance the credibility of the results and recommendations of this water plan, to help appraise the success in solving the region's water problems, and to guide the region to improve remedial actions.

On an operational basis, most of the larger public water supply, flood control, and irrigation system entities in the planning region already employ a geographic information system (GIS) as part of their overall system management practices. It is further recommended that use of GIS data be expanded and coordinated by establishing an integrated water use and water budget database and be compiled into a regional database organized according to standards that would allow for ready exchange of information. The data should include; but not be limited to; surface water gauging, ground water levels, public water supply, irrigation flows and returns, domestic wells, flood, and water quality data. This data can be available for historical trend analysis, current conditions profile, and future projections of water supply and demand.

All of the databases and GIS should be integrated and be usable by different agencies and in different plans.

R2-7—Watershed Management Plans (A-66, A-33)

The preservation and management of water resources must be conducted on a regional basis of watersheds and geologic basins. It is recommended that specific watershed management plans should be established in the Middle Rio Grande planning region to achieve common objectives such as: increasing water yield; reducing storm water runoff and preventing soil erosion; improving woodland and rangeland health; increasing infiltration and protecting aquifer recharge zones, and ensuring water quality protection from non-point source pollution. However, watersheds should not be managed to increase water yield at the expense of habitat degradation. It is recommended that a basin-wide coordinating function be established.

It is recommended that governmental jurisdictions, water management agencies, and private water system developers should utilize standard best management practices (BMPs) for watershed protection.

R2-8—Comprehensive, Integrated, and Continued Water Planning (A-53)

There must be connection and continuity between water resource planning and other major planning elements in the regional planning process. It is therefore recommended that local government jurisdictions and regional planning agencies work cooperatively to integrate water plans with planning for land use, transportation, economic development, and other planning efforts of regional significance. The scope of regional water resource planning must cover any and all water-related issues.

Regional water planning should continue through an open, inclusive, and deliberative process to ensure diverse stakeholder participation in the decision making process (A-53).

In implementing the regional water plan, the Water Resources Board and the Water Assembly should work together to establish a process for monitoring and measuring progress toward achieving success of the plan.

In addition, it is recommended that continuing efforts be made to enhance the quality and quantity of hydrological data for water budgeting. For instance, while well studied, the inflows, consumptive uses, and interaction between ground water and surface water in the region still contain uncertainties. While within reasonable ranges of each other, different studies yield somewhat different numbers. Further study would enhance the credibility of results and recommendations, would help to appraise our success in solving the region's water problems, and would guide us to improved remedial actions.

R2-9—Storm Water Management Plans (A-34)

Storm water runoff can and should be utilized by the region when practicable. It is recommended that local government storm water plans be enhanced and expanded to control runoff, using swales, terraces and retention structures to minimize erosion, enhance infiltration, and recharge, and prevent pollution of surface and ground water.

It is recommended that flood control authorities include infiltration, seepage, pollution control and aquifer recharge in their mission.

R2-10—Cooperative Regional Water Management (A-67)

Jurisdictions within the region are encouraged to work together to design implementation mechanisms for the plan that are effective, fair, wise, equitable, legal, and appropriate to local community concerns and meet the plan's mission and goals.

This plan recommends that the local jurisdictions explicitly share the task of balancing the regional water use with renewable supply and implement sustainable water resource management to reduce water consumption, minimize impact on water resources, encourage conservation-oriented economic development; ensure adequate water supplies for any proposed development, protect and enhance the environment, and consider the carrying capacity and location of development, integrate with other major plans in the region.

This recommendation could create a mechanism for funding larger projects by pooling resources.

R2-11—Water Banking (A-67A)

Water banking is a term used for several different concepts for leasing water. Only senior water rights that can actually be fulfilled, taking into account the hydrologic system's demands on wet water, may be transferred or "banked". Leasing of water through a water-banking system or entity can only be workable if clearly defined policy is developed. Legislation is recommended that will provide individual and other vested water right holders with a range of options for short-term leasing of water (less than five years) for purposes such as aquifer recharge, Compact deliveries, environmental needs, and meeting demands of other senior users in times of shortage, thereby increasing water management flexibility.

Agricultural forbearance should be investigated and, encouraged if feasible, to facilitate the leasing of agricultural water on a voluntary basis from farmers willing to enter into such leases.

The scenario permits the emergency leasing of agricultural water to meet Rio Grande Compact obligations and environmental needs. It also proposes protective mechanisms to support the overall value of agricultural lands, including:

- benefits to ecosystem health
- potential in terms of recharge, compact delivery, food security and economics
- cultural and historic value
- contribution to the ~~quality of regional air~~ quality and regional vistas ~~shed and viewshed~~
- agricultural economy

R2-12—Land Use Management and Planning (A-52, A-30, A-28, A-144)

Encourage local jurisdictions to integrate the land use, transportation, economic development, and water components of each of their comprehensive plans; and to integrate their comprehensive plans with the regional water plan.

Local jurisdictions should:

- Increase urban building densities and infill development through adoption of local government land use policies, incentives, and regulations. Higher-density development would reduce the relative footage of landscaping and associated water use.

The following Items were approved by the Water Assembly, but the Water Resources Board wants to be on record as opposing their inclusion:

- Prepare and adopt water budgets which provide specific annual targets/limits for new development based on known available water resources. Water budgets should be reviewed annually and revised as necessary.
- Adopt policies to integrate land use and transportation planning and water resource management in all government jurisdictions in the Middle Rio Grande water planning region; and take water supply

availability into account when making land use development decisions. Adopt policies that coordinate water impact considerations with all land development and other uses of water.

- Develop a sustainable and coordinated growth management plan for adoption and implementation by local governments in the middle Rio Grande region in order to: 1) reduce water consumption; 2) minimize impact on water resources; 3) encourage conservation-oriented economic development and 4) ensure adequate water supplies for any proposed development. Local governments and/or the state Legislature should establish a review process so that each new industrial, commercial, residential and municipal development be reviewed to ensure ongoing availability of adequate water supplies, including recognition of cumulative impacts on water.
- Establish, assess and collect development impact fees that include the marginal full cost of extending the water service area and the marginal full cost to purchase and transfer associated water rights.

10.2.3 Water Monitoring and Measurement

R3-1—Measure All Water Uses (A-7, A-8, A-73)

Unmeasured water is seen to be a major encouragement to casual or excessive water use. The recommendation is that all uses of water in the region be measured and reported at the single user level. Measuring only particular types of users or particular individual users is publicly seen to be unfair. The recommendation is to establish the measuring program immediately for all new uses, and as a gradual retrofit to existing uses, as soon as possible. This recommendation is for local and state governments to implement incentive, regulatory, and/or public education policies so as to stimulate the prompt installation of appropriate retrofit measurement devices. Besides the direct benefit of water savings, this recommendation will enable much more incisive and efficient management of our surface-water and ground-water supplies. This will entail costs, and the appropriate bodies should consider how these costs would most fairly be borne.

10.2.4 Agriculture

R4-1—Upgrade Agricultural Conveyance Systems (A-9)

The recommendation is to line or pipe a limited number of Middle Rio Grande Conservancy District and on-farm ditches so as to obtain a greater efficiency in delivering water to fields. Areas to be lined should be selected after consideration of the impact on water quality, domestic wells, riparian vegetation, wildlife habitat, and so as not lose vital shallow aquifer recharge. New turnouts and improved irrigation water management could also allow for a decrease in diversions while meeting crop needs.

This savings in diversions would allow, when possible, stored water in upstream reservoirs to last longer in dry years, which would both help farmers and keep water in the river later in the irrigation season, and thus relieve some of the pressure for helping species and other environmental concerns. It is recommended that upstream reservoirs should be utilized to store saved water due to reduced diversion. This recommendation is seen to require some major funding and construction effort. Federal funding should be sought immediately. Work should commence as soon as funds are available. Because of existing and increasing Endangered Species Act pressure, progress on this recommendation is seen to be urgent.

Irrigation efficiencies, studies, and programs as implemented in California should be studied as well.

R4-2—Level Irrigated Fields (A-10)

Many farm fields in the region have been laser-leveled. This recommendation is to encourage farmers through incentive programs to laser level those fields that have not been leveled or that may require a change in grade to facilitate an improved delivery system. This recommendation is for local and state governments (or federal if possible) to implement incentive, regulatory, and/or public education policies to

state should also engage in and collaborate with programs designed with the goal of restoring the ecological functioning of the region's rivers and floodplains, including replication of the natural hydrograph of the rivers within the levees. The state should seek to assure that an appropriate quantity of water is available for endangered species and river needs without depriving priority water rights holders or San Juan-Chama Project water contractors of their water except from willing sellers or lessors.

To allow support of the river and its riparian environment, the scenario includes recognizing instream flow as a beneficial use.

R6-4—Recognize the Importance of Healthy Native Ecosystems of the Rio Grande and its Tributaries (Goal B)

Healthy native riparian ecosystems mean a river and floodplain habitat adequate to support viable population of a diverse array of plants and animals native to the region. Healthy native riparian ecosystems are important for their own sake, for the ways in which they enhance our quality of life, and for the services that they provide to us.

The Rio Grande is important for what it symbolizes and means to the people of the region. The Rio Grande is a mythic river in the history of the region, the state, and America. A living Rio Grande embodies the spirit of our region. It is independent, free, tough, hard-working, and enduring.

Riparian ecosystems support a myriad of plant and animal species, from magnificent cottonwoods and sandhill cranes to unnoticed minnows. They support that portion of creation of which we are stewards. Rivers and bosques provide refuges where human inhabitants of the region can relax, enjoy the scenery and the water, hike, fish, raft, watch birds, and otherwise enjoy nature and the outdoors.

The Rio Grande and its tributaries provided the water that made human habitation possible in the region. A clean and healthy Rio Grande is essential to the agricultural traditions of the middle valley, as well as to urban populations that will increasingly depend on the river for domestic and other uses now and in the future. The bosque protects the levees from flood waters and therefore protects our property. It filters and cleanses water entering and leaving the river. Finally, though not least important, a clean and healthy Rio Grande is important to the spiritual and cultural traditions of our region.

10.2.7 Water Storage to Reduce Evaporative Losses

R7-1—Implement Upstream Surface Water Storage (A-45)

An average of 140,000 afpy evaporates from Elephant Butte Reservoir (EBR) due to the large surface area and the hot, dry, windy conditions. EBR could be used to store water up to the top of the narrows (i.e., the deep water portion of the reservoir), thereby greatly reducing surface area, and still be used to make downstream deliveries. The recommendation is to obtain the necessary permissions to store water in upstream reservoirs with lower evaporation rates if this can be done without significant harm to the riparian environment. So as to minimize impact to the local economy of Elephant Butte, it would be desirable to manage flows to keep Elephant Butte Reservoir storing steady but minimal quantities of water (e.g., 400,000 acre-feet of usable water to allow storage of water in upstream reservoirs constructed after 1929 per Rio Grande Compact requirements. Usable water is that water legally available for release for downstream use and is defined as the combined content of Elephant Butte and Caballo Reservoirs less any New Mexico or Colorado credit water and less any San Juan/Chama project water in Elephant Butte Reservoir.). The OSE should pursue necessary agreements and authorizations to permit this upstream storage.

R7-2—Implement Upstream Aquifer Water Storage (A-46)

Pump surplus water into the aquifer so as to supplant the requirements to store large quantities in Elephant Butte Reservoir. Technology assessment and engineering feasibility for this recommendation should be started so as to determine whether the option is really practical within this region.

R7-3—Implement Aquifer Storage and Recovery for Drought (A-46)

Subject to water rights and environmental issues, in order to ameliorate the short term fluctuations in regional supply, it is recommended that surplus water be pumped into the depleted aquifers during wet years, and be retrieved for use during dry years. This system would be smaller than one used to supplant EBR evaporation. Technology assessment and engineering feasibility for these recommendations should be started so as to determine whether these options are really practical within this region.

R7-4—Water Modeling (A-38, A-143, A-144)

The state and appropriate federal agencies should improve and increase monitoring and modeling of the surface water system, improve water management at the watershed level, and retain excess water flow from EBR during wet cycles. It is recommended that the state use the modeling data to anticipate and manage EBR spills and to better administer upstream retention and aquifer recharge.

10.2.8 Desalination and Transfer of Water

The Regional Water Planning Handbook states that “all future water needs must be met by management of the water supply currently available to the region. If that is not feasible, as supported by analysis in the planning report, other sources of supply may be proposed if feasible in economic and engineering analysis.” (OSE/ISC 1994) Refer to Supporting Document H-1. The following recommendations are proposed to augment the supply from sources outside the region as indicated in the analyses of substantial regional shortfall.

R8-1—Develop New Water Supplies through Desalination (A-39)

Substantial supplies of brackish and saline water exist in New Mexico. It is estimated that increases in the price of water, project development time, and technological improvements will make the desalination and importation of brackish water practical within twenty years. The recommendation is for the region to explore the possibility of developing brackish and saline water supplies, both from sources within and outside of the region. The region should track technological advances that would make desalination cost effective. It is further recommended that the region implement projects that will make such water available for use within the region or provide the region with appropriate Rio Grande Compact credits.

R8-2—Investigate the Potential for Importing Water (A-69)

Examine the potential of securing and importing large volumes of water from currently unused sources. This option should be interpreted broadly to include the availability of water from sources such as abandoned mines, and desalinated seawater. Water should not be imported where it would cause environmental harm or economic hardship to communities in the watershed from which water is being imported, or where projects rely upon large federal subsidies provide limited economic benefits.

R8-3—Undeclared Water (A-39, A-69, A-143)

The State Engineer should declare all waters in the state, regardless of depth and quality, so as to enable proper administration and protection of all of the waters in the state.

10.2.9 Public Education

R9-1—Develop a Water Education Curriculum for Schools (A-56)

This plan recommends that school curricula and projects be developed to teach children the importance and value of water in the region. Especially important are issues of water conservation, where water comes from, and cultural values associated with water.