Appendix E

SSPA Reports

Appendix E1

SSPA Middle Rio Grande Water Supply Study

Appendix E1. SSPA Middle Rio Grande Water Supply Study

The following report is an interim draft based on ongoing work of S.S.Papadopulos and Associates, Inc. and reflects work completed as of the date of this publication. This work has not yet been reviewed and accepted by the ISC and the Corps of Engineers. Updates to this work will be published at http://www.seo.state.nm.us/water-info/mrgwss/index.html

Middle Rio Grande Water Supply Study, Phase 3

INTERIM PARTIAL DRAFT

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August 6, 2003

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Middle Rio Grande Water Supply Study, Phase 3

INTERIM PARTIAL DRAFT
This study is in progress. Interim results have not yet been reviewed by the Executive Steering Committee or by the Contracting Agencies.

Prepared for:

U. S. Army Corps of Engineers
Albuquerque District

Contract No. DACW47-99-C-0012

and

New Mexico Interstate Stream Commission

Prepared by:

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GLOSSARY

Actual Elephant Butte Effective Supply – the recorded flow of the Rio Grande at the gaging station below Elephant Butte Dam, adjusted for net changes in storage in the Elephant Butte reservoir during the year as determined by the Rio Grande Compact commissioners

Aquifer – a saturated zone of soil beneath the ground surface capable of yielding water to wells

Cone of depression – area immediately surrounding a well, where the groundwater elevation is lowered due to effects of pumping from wells

Conjunctive-use – use of a combination of water sources for water supply; i.e., use of surface water and groundwater

Consumptive irrigation requirement – the quantity of irrigation water that is consumptively used by crops or is evaporated from the soil surface within a designated period of time. The consumptive irrigation requirement is equal to the consumptive use minus the effective rainfall.

Consumptive use – the amount of water lost from the hydrologic system through evaporation, transpiration, and the building of plant tissue in a specified period of time.

Correlation analysis – involves the determination of the relationship between different processes. (For example, the likelihood that the flow of the Jemez River will be high if the Otowi native flow is high in a particular year.)

Credits and debits – the excess, or shortage, of surface water actually delivered, compared to the obligation, according to the Rio Grande Compact

Credit/debit balance – the end-of-the-year balance of credits and debits accrued under the Rio Grande Compact

Depletion – losses from the water supply for agricultural, domestic, riparian use or evaporation from open water surfaces

Depletion graphs – graphs showing the net depletion through a defined river reach; these graphs illustrate where net gains and losses are occurring

Deterministic – exhibiting behavior that can be described according to the laws of physics

Descriptive statistics – involves describing the nature of, and variability in, a population or set of events. (For example, the average, maximum, and minimum payout of a slot machine and how often it pays out.)

Double-mass curves – graphs depicting / comparing upstream and downstream cumulative flows within a defined reach of river versus time

Effective rainfall – rainwater available for use by plants; the portion of the rainfall event that does not flow overland into an arroyo or stream, infiltrate to the water table and contribute to aquifer recharge, or become lost to immediate evaporation from soils.

Elephant Butte Effective Index Supply – (also called *Elephant Butte Scheduled Delivery*) the delivery obligation at Elephant Butte, according to the Rio Grande Compact. The value of this delivery obligation is determined based on inflow conditions at the Otowi Gage.

Elephant Butte Scheduled Delivery – (also called *Elephant Butte Effective Index Supply*) the delivery obligation at Elephant Butte, according to the Rio Grande Compact. The value of this delivery obligation is determined based on inflow conditions at the Otowi Gage.

Ephemeral tributaries – rivers or streams that only flow during certain times of the year or under certain hydrologic conditions.

Evapotranspiration (ET) – the combined processes of simple evaporation and plant transpiration through which liquid water is converted to water vapor and lost to the atmosphere

Evapotranspiration rate – the rate at which evapotranspiration occurs. In this study, measured in acre-feet per acre per year

Farm delivery – The amount of water delivered to a farm for irrigation of crops.

[Water] Gains – increases in the water supply within a system or reach of a river. For example, gains to streamflow may occur due to precipitation, snowmelt, wastewater discharge, or agricultural return flow.

Metadata – Data about data. Metadata may include site identification information, spatial organization and reference, data quality, temporal data, entity and attribute information, distribution, and reference information.

Monte Carlo Analysis – The Monte Carlo method provides approximate solutions to mathematical problems by performing statistical sampling experiments. The method is useful for obtaining numerical solutions to problems which are too complicated to solve analytically. In the context of the work presented in this document, Monte Carlo Analysis means fitting individual flow and depletion terms with a *probability distribution*. Then, for each run of the model, a random number is generated for each probabilistic term, and that random number is used to select a value for the term from the term's probability distribution. Values for all terms are summed to give a final annual result. This is repeated 10,000 times to provide a distribution of outcomes. A given year's results have no influence on previous or future years.

Native water – Surface water from the Rio Grande and Chama River originating in Colorado and Northern New Mexico

Net Supply – Monthly diversions to irrigation canals reported by the irrigation district to the USBR

Otowi Index Supply – the recorded flow of the Rio Grande at Otowi Bridge, adjusted for storage in reservoirs constructed after 1929 and for trans-mountain diversions.

Perennial tributaries – rivers or streams that flow continuously throughout the year.

Probabilistic – (also called *stochastic*) exhibiting uncertainty that can be described using the laws of chance

Probability distribution fitting – the process of finding a curve or mathematical formula to describe a set of measured data

Quaternary alluvium – Generally unconsolidated geologic materials deposited by rivers during the Quaternary period of geologic time (within the past two million years).

Return flows – Water returning to the river after diversion into irrigation canals, including tail water from farms, drainflow or applied irrigation water seeping past the root zone to groundwater.

Rio Grande Compact – agreement passed by Congress in 1939 governing the delivery obligations of Colorado to New Mexico and New Mexico to Texas for waters of the Rio Grande basin.

Risk analysis – (also called uncertainty analysis) method for considering the combined effects of multiple probabilistic (uncertain) processes, and/or characterizing the range of possible outcomes

Salvaged evapotranspiration – a decrease in the evapotranspiration rate due to such factors as a decrease in availability of shallow groundwater to plants

San Juan-Chama Project water – Surface water from the Colorado River system delivered through the San Juan-Chama Project to the Rio Chama and thence to the Rio Grande

Santa Fe Group aquifer system – a deep complex of unconsolidated alluvial sediments along the Rio Grande that form an aquifer that is hydraulically connected with the Rio Grande.

[Water] Source – a resource for either surface or groundwater

Spill year – A year during which there is flow over the spillway at the Elephant Butte Reservoir (hypothetical spills may occur without an actual spill, given certain conditions, and are treated similarly under the Compact)

Static value – a term defined as a constant within the probabilistic water-budget model

Steady-state conditions – a system at equilibrium; conditions at which the system has stabilized

Storage – the amount of water existing in the interstices of a geologic medium as part of a groundwater system

Stream-connected aquifer – an aquifer with hydraulic connection with a surface water system. In a stream-connected aquifer, the pumping of groundwater will eventually reduce stream flow within the same basin

Trans-mountain diversions – Water diverted from drainage systems other than the Rio Grande, for use in the Rio Grande system (i.e., San Juan-Chama Project water)

USGS gaging stations – locations where the U. S. Geological Survey has installed equipment for monitoring of river level and flow rate

Waste – A term used in USBR monthly water distribution data sheets for water returned to the river through wasteways and drains

Water budget – A summary that shows the balance in a hydrologic system between water supplies to the system (inflow) and water losses from the system (outflow)

Water supply – the amount of water potentially available for use within a study area; this must account for both the hydrologic supply and the legal limitations imposed by water allocation agreements such as the Rio Grande Compact

Acronyms

AMAFCA – Albuquerque Metropolitan Arroyo Flood Control Authority

COE – U.S. Army Corps of Engineers

DEM – Digital Elevation Models

DRG – Digital Raster Graphics

EDAC – Earth Data Analysis Center

EPA – U.S. Environmental Protection Agency

ESC – Executive Steering Committee

FGDC – Federal Geographic Data Committee

GIS – Geographic Information Systems

HRAP – National Weather Service Hydrologic Rainfall Analysis Project

ISC – New Mexico Interstate Stream Commission

LUTA – Land Use Trend Analysis

MRGCD – Middle Rio Grande Conservancy District

NEXRAD – NEXt Generation Weather RADar System. A network of approximately 160 radar systems throughout the United States and at several overseas locations, which provide precipitation information. The system was installed by the National Weather Service, in conjunction with other agencies.

NPDES – National Pollution Discharge Elimination System

OSE – New Mexico Office of the State Engineer

PDSI – Palmer Drought Severity Index

USBR – U. S. Bureau of Reclamation

USGS – U. S. Geological Survey

URGWOM – Upper Rio Grande Water Operations Model

1.0 INTRODUCTION

1.1 Study History and Objectives

The Middle Rio Grande Water Supply Study was conducted by S.S. Papadopulos & Associates, Inc. (SSPA) to develop a quantitative and *probabilistic* description of the *conjunctive-use* groundwater and surface water supply available to the Middle Rio Grande region, under the constraints of the *Rio Grande Compact*. This study was initiated under U.S. Army Corps of Engineers (COE) Contract DACW47-99-C-0012 in 1999 and was jointly funded by the COE and the New Mexico Interstate Stream Commission (ISC). This study has assembled and evaluated water supply information and describes conditions relevant to maintaining compliance with the Rio Grande Compact.

This study has been conducted through three phases:

Phase 1: Development of a Work Plan, reflecting input from the contracting agencies and an Executive Steering Committee (SSPA, September 1999).

Phase 2: Implementation of the Phase 1 Work Plan, with a report presenting the quantitative, probabilistic assessment of water supply from Cochiti to Elephant Butte (SSPA, 2000).

Phase 3: Further refinement of the water budget and water supply quantification; additional technical analyses; and, support to regional planning groups.

Phase 2 of this study culminated in a report entitled *Middle Rio Grande Water Supply Study* (S.S. Papadopulos & Associates, Inc., August 2000). In addition to the report, key products of Phase 2 included:

- A summary of available data in the Middle Rio Grande Basin;
- A bibliography of water-resource reference material;
- A discussion of previous *water budget and depletion* studies;
- Quantification of the impacts on flow of the Rio Grande from groundwater pumping;
- Quantification of the natural variability of water sources for the Middle Rio Grande region;
- A *risk analysis* evaluation of the water supply, identifying the range of expected water supply conditions;
- Evaluation of the probability of achieving compliance under the Rio Grande Compact, given present water demands; and,

- Evaluation of the probability of achieving compliance under the Rio Grande Compact, given a hypothetical alternative demand scenario.

Following the completion of Phase 2 of this study, additional funding became available to continue the work into a third phase. A plan of work was developed for Phase 3, which included data updates, additional technical analyses and some technical support to regional planning entities within the project study area. The goals of this third phase include:

- Updating and refining hydrologic functions in the probabilistic model to reflect new information;
- Refining climate-based dependencies for key water budget terms, including the development of climate dependency functions that were beyond the scope of work for Phase 2 analysis;
- Extending hydrologic functions to represent drought conditions;
- Reviewing long-term climate trends, using proxy-based reconstructions (i.e. tree rings) and ENSO (El Nino – Southern Oscillation) based projections for future changes, to further characterize potential variability in water budget terms;
- Developing an approach for handling antecedent conditions in functional relationships;
- Providing technical assistance to the Middle Rio Grande and Socorro-Sierra regional water planning groups in assessing the hydrologic impacts of chosen water planning alternatives on regional water use and on Compact deliveries.

This report describes the activities conducted in Phase 3, describes the updated probabilistic water budget and describes the evaluation of regional water planning alternatives.

1.2 Study Area

The *study area* for this project extends along the Rio Grande, north to south, from Cochiti Reservoir to Elephant Butte Reservoir, a distance of approximately 175 miles (Figure 1.1). This area, often termed the Middle Rio Grande region, is of greater extent than the *Middle Rio Grande Planning Region* (MRGPR) that extends through a portion of the Study Area. Upstream and downstream river gages that are associated with the study area include the Rio Grande at Otowi Bridge gage, upstream of Cochiti Reservoir, and the Rio Grande below Elephant Butte gage, downstream of Elephant Butte Reservoir. Water use within this reach is subject to limits set forth under the Rio Grande Compact, based on flow at the two above-mentioned gages. The study area includes groundwater within the *Quaternary alluvium* and the *Santa Fe Group* aquifer system.

The Study Area for this project was originally selected to support analysis of supply and demand by multiple entities in the Rio Grande Basin in the context of the Rio Grande Compact. While the study was envisioned to provide information and support to the *planning regions* within this area, the Study Area was not identified by the contracting agencies as being fully coincident with planning regions. The study area includes part of the Sangre y Jemez Regional Planning Region (SJPR), all of the Middle Rio Grande Planning Region (MRGPR) and a large area within the Socorro-Sierra Planning Region (SSPR). The SSPR is not fully encompassed within the Study Area, as the SSPR also includes areas of Sierra County south of Elephant Butte Dam, for example, a portion of the Rincon Valley, and the SSPR includes some areas in of Socorro and Sierra counties that lie to the west of the Albuquerque and Socorro basins, for example, the La Jencia Basin.

1.3 Study Approach

The water supply to the Middle Rio Grande region includes:

- Surface water from the Rio Grande and Chama River originating in Colorado and Northern New Mexico (*native flow*);
- Surface water from the Colorado River system delivered through the San Juan-Chama Project (*San Juan-Chama Project* water, or *trans-mountain diversions*);
- Tributary surface water, flowing to the Rio Grande from *perennial* and *ephemeral tributaries* between the Otowi gage and Elephant Butte Dam; and,
- Groundwater of the Albuquerque Basin, the Socorro Basin and other *stream-connected aquifer*s in communication with the Rio Grande.

This regional water supply, with the provisions of the 1938 Rio Grande Compact, is characterized by **variability** and **limitation**.

Variability is exhibited in the historic record of inflow components to the Middle Rio Grande region, including the mainstem inflow at the Otowi gage and tributary inflows. Figure 1.2 illustrates this variability with a graph showing the magnitude of the mainstem inflow at the Otowi gage from 1940 to 2002. Characterized with a mean value of approximately 1.1 million acre-feet per year over this period of 63 years, the annual supply varies considerably, with values throughout the range of 0.5 to 1.5 million acre-feet per year not uncommon.

Limitation on the useable supply for the Middle Rio Grande region is derived from physical and institutional bases. Figure 1.3 illustrates the portion of the Otowi inflow historically available for use in the Middle Rio Grande region. This graph shows the allocation of the gaged flow at Otowi (including trans-mountain diversion water) into the quantity available for use in the Middle Rio Grande region, and the quantity required to be delivered for use below Elephant Butte Reservoir. The portion of the Otowi inflow available to the Middle Rio Grande region is augmented by tributary inflow and groundwater. While these sources offer significant potential to increase or manage the supply, neither fully removes the effect of limitations on supply imposed by physical conditions and institutional constraints.

Quantification of variability in water supply components and recognition of Compact-based limitations are fundamental for the quantification of the water supply. Therefore, this study focuses on characterizing the variability in inflow supply components and in depletion components. This variability is tracked through the water budget for the study region to quantify the range of likely water supply conditions. The quantified water supply is the amount of water potentially available for use, or depletion, within the study area. This concept reflects both hydrologic limitations and legal limitations of the Rio Grande Compact.

The Middle Rio Grande water supply is quantified in this study using the historical variability of climate-dependent inflow components. To relate this supply to reach-specific demands, the available supply is compared to depletions under present river conditions, and under proposed regional water planning alternatives. The identification of depletions draws from past and in-progress water budget and depletion studies by other investigators. The probabilistic quantification of the water supply employs risk analysis tools. Using risk analysis tools, variability and correlations within the river system are used to determine the range of water supply conditions, including droughts and high supply years.

1.4 Executive Steering Committee Role

An Executive Steering Committee (ESC) was commissioned to provide technical advice and guidance regarding preparation of the Middle Rio Grande Water Supply. A Charter, signed by the New Mexico Interstate Stream Engineer and the District Engineer for the Albuquerque District, U.S. Army Corps of Engineers, sets forth the background, purpose, duties, chain of command, meetings and schedule and membership of the ESC. Accordingly, the ESC convened periodically with the study team. Phase 3 meetings included a kick-off informational meeting and Work Plan presentation in September 2001, progress meetings in September 2002 and October 2003, and a public meeting in the spring of 2004. The ESC included technical representatives from a diverse group of stakeholders and agencies within the Middle Rio Grande region. Agencies and groups invited to participate on the ESC are listed in Table 1.1. Several of the Committee members were provided insights throughout the study, and their assistance is gratefully acknowledged.

1.5 Report Organization

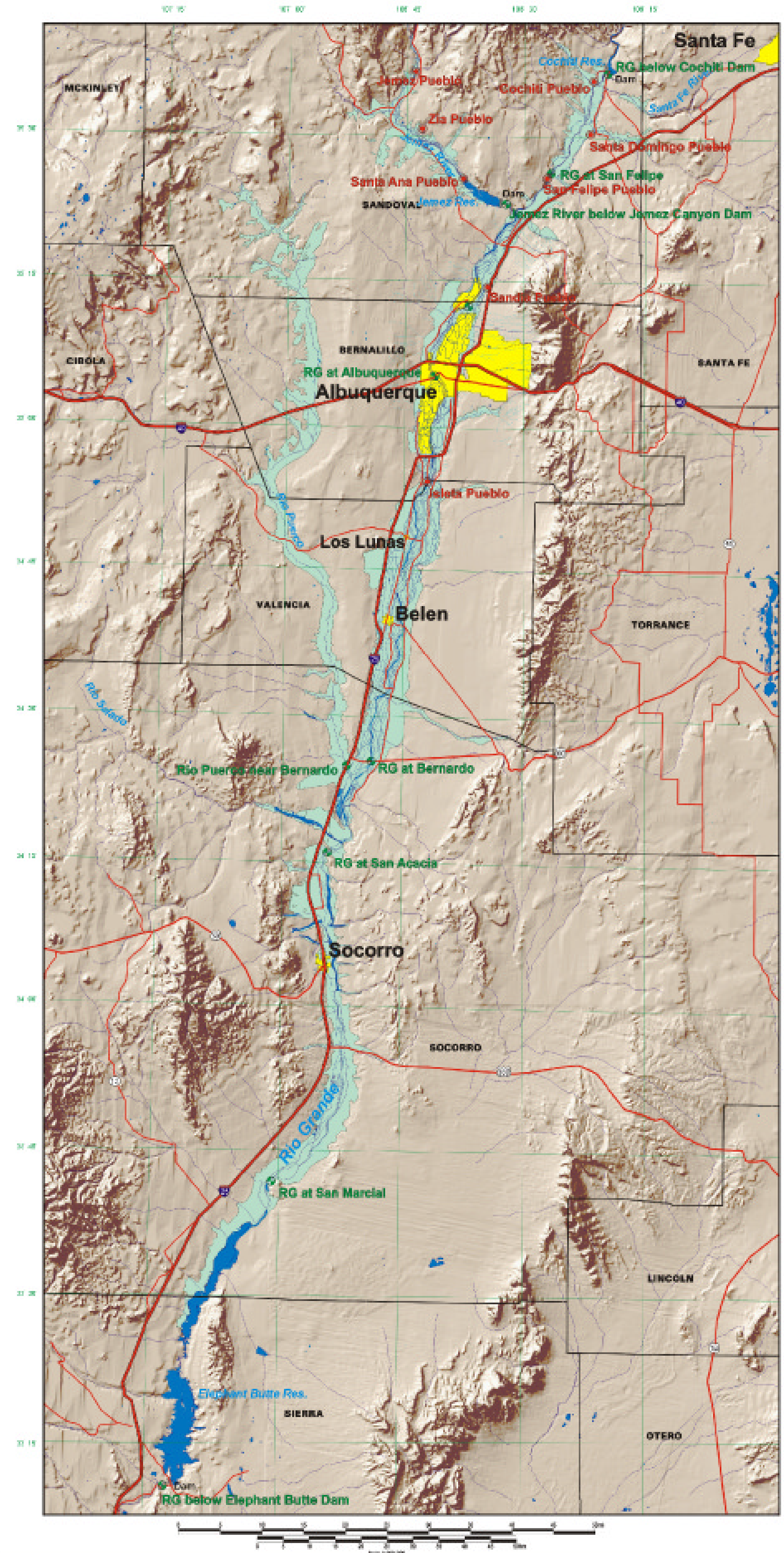
The main body of this report describes the procedures, results and work products of the study. Section 1 provides an introduction to the study and the report. Section 2 provides background information on topics of key importance to the study. Section 3 describes the available data and resources. Section 4 describes the conjunctive-use water supply to the Middle Rio Grande region in probabilistic terms. Section 5 describes regional planning support work done as part of the study. Section 6 describes implications of the study for future work and planning in the Middle Rio Grande region. The report also includes a glossary and a list of acronyms.

To maintain readability of the report, detailed technical material and supporting data are organized within several appendices. These appendices include the metadata database, summaries of key data sets, groundwater modeling details, statistical and risk analyses, and additional work products produced as part of the regional planning support work.

The project report is available for download from the project website, **http://www.ose.state.nm.us/water-info/mrgwss/index.html**. The project website also contains other project related material, including an illustrated summary of water budget data, metadata, bibliographic material and the project basemap.

Middle Rio Grande Water Supply Study

Figure 1.1
Map of Study Area: Cochiti Reservoir to Elephant Butte Reservoir



LEGEND

- State Highway
- U.S. Highway
- Interstate
- County Line
- Perennial Stream/River
- Intermittent Stream/River
- Latitude/Longitude
- City
- Lake/Reservoir
- Valley Alluvium
- Pueblo
- Gage Station

The purpose of the Middle Rio Grande Water Supply Study is to prepare a quantitative description of the conjunctive-use ground and surface water supply available to the Middle Rio Grande from Cochiti Reservoir to Elephant Butte Reservoir. This will be conducted under the constraints of the Rio Grande Compact and upstream Rio Grande basin water use with New Mexico. The Middle Rio Grande Water Supply Study will identify, assemble, and evaluate existing pertinent water supply and water budget data sets and present them in a form that can be used by regional water planning entities in the Middle Rio Grande. The product of the study will be used by others to develop and evaluate alternatives that reconcile projections of water demand with available water supply by the Interstate stream Commission in developing strategies to meet new Mexico's delivery obligations to Elephant Butte Reservoir under the Rio Grande Compact.

Sources: Base data compiled from USGS 1:100000k DLG and DEM files. Land use data provide by the Earth Data Analysis Center and was derived from the 1992 Land Use Trend Analysis study performed by the Bureau of Reclamation. Note Land use coverages not available south (approx.) of 33 33'

BB Consulting Group, Inc.

Revised 11/23/99

Figure 1.2 Variability: Flow of Rio Grande at Otowi Bridge, 1940 to 2002

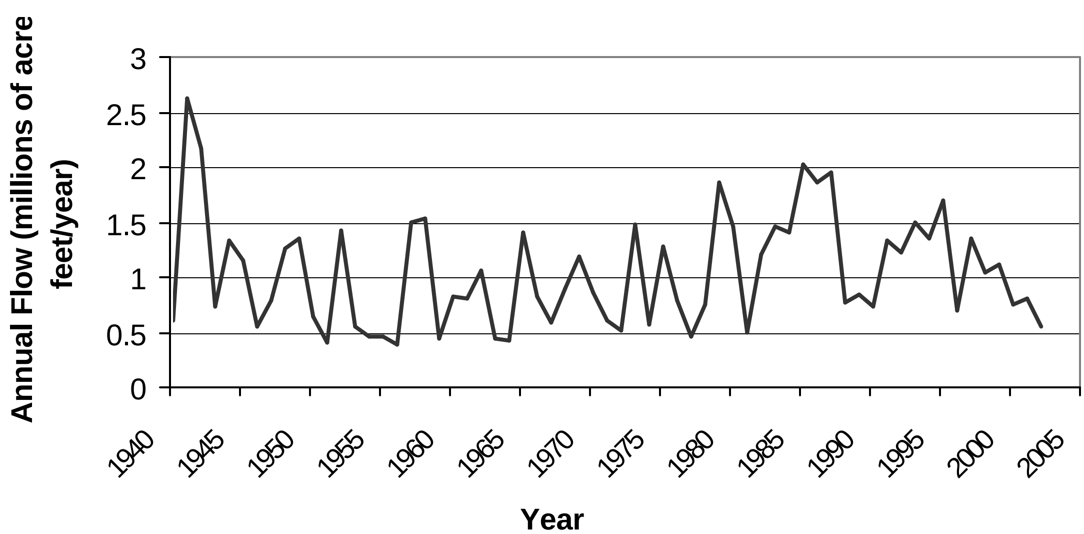


Figure 1.3 Limitation: Base Supply to the Middle Rio Grande Region (Rio Grande at Otowi Bridge minus Elephant Butte Scheduled Delivery)

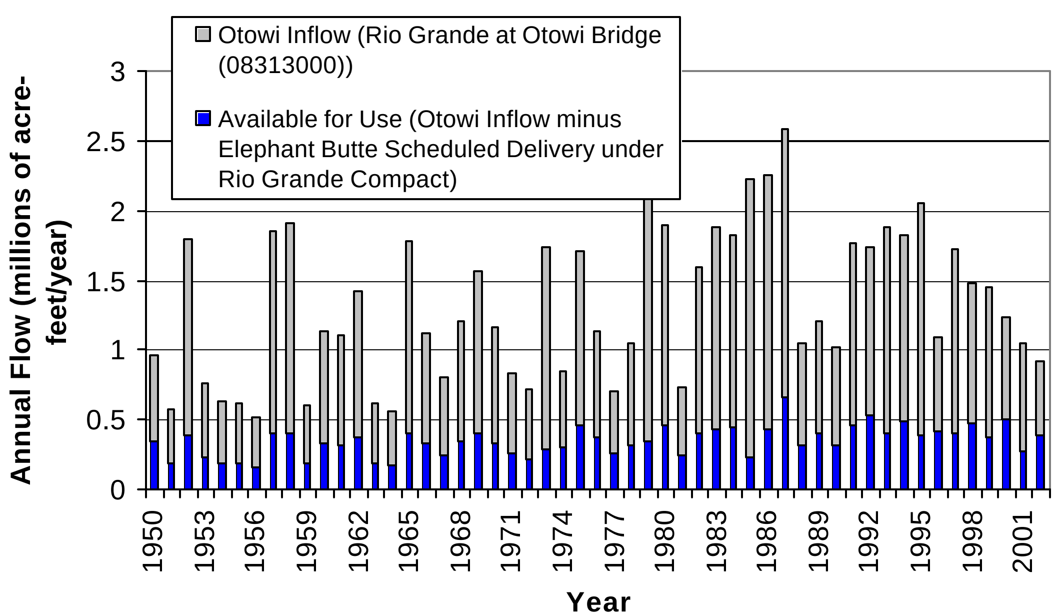


Table 1.1
Executive Steering Committee

The following entities were invited to participate on the Executive Steering Committee:

Alliance for the Rio Grande Heritage
Army Corps of Engineers
Bureau of Indian Affairs
Bureau of Reclamation
City of Albuquerque
JMC Farms
Middle Rio Grande Conservancy District
Middle Rio Grande Council of Governments
New Mexico Environment Department
New Mexico Interstate Stream Commission
New Mexico Office of the State Engineer
Pueblo of Cochiti
Pueblo of Isleta
Pueblo of Jemez
Pueblo of San Felipe
Pueblo of Santa Ana
Pueblo of Santo Domingo
Pueblo of Sandia
Pueblo of Zia
Rio Grande Restoration
Socorro-Sierra Planning Region
University of New Mexico, Department of Civil Engineering
U.S. Fish and Wildlife Service
U.S. Geological Survey
Mike Kernodle, Hydrogeologist
Frank Titus, Hydrogeologist

2.0 BACKGROUND

Background information is provided in this section on six topics important to this study. The first of these topics, regional water planning, describes the basic goals of the New Mexico's water planning process and the role SSPA played in assessing selected planning alternatives developed by the MRGPR and the SSPR. The second topic, the Rio Grande Compact, describes the interstate agreement underlying the delivery obligations downstream of the Study Area. The third, forth and fifth topics, groundwater-stream interaction, water budgets, and concepts of probability and risk analysis, describe technical concepts and analyses that are fundamental to the study approach. The sixth topic, climate variability in the period of record, outlines how the climate since 1950 relates to the climate of the past 1,000 years, as recorded in tree-rings, in particular focusing on whether recent climate is representative of past climates.

The background discussion in this section is provided as a primer, for readers less familiar with these concepts. In addition, the reader will find additional background resources in the annotated bibliography and list of web resources prepared for this study, available on the project website at **http://www.ose.state.nm.us/water-info/mrgwss/index.html**.

2.1 <u>Regional Water Planning</u>

In 1987, New Mexico's legislature enacted legislation to support regional water planning, *"Authorizing the Interstate Stream Commission to fund Regional Water Planning Efforts."* Regional water planning is being implemented to protect the water resources of the State with the goal of allowing stakeholders within a region to help determine the direction of water use within the region and between regions of the state. Planning regions are self-defined based on hydrological and political common interests.

The New Mexico legislature recognized and directed that water planning is most effectively done at the local level. However, since the state may decide to use the regional water plans as a basis for a state water plan, which can in turn influence litigation, water development, and legislation, consistency among plans was desired. The New Mexico Interstate Stream Commission published the *Regional Water Planning Handbook* (Handbook) in 1994 to guide the regional planning process (New Mexico

Interstate Stream Commission, 1994). The Handbook sets forth several required planning assumptions to be followed unless exceptions are adequately justified:

1. Public participation must be the significant factor in development of regional plans.
2. Plans are to be based upon existing water and related law, while suggestions for change may be noted.
3. All present and future water demands must be met with currently existing supplies of the region, unless exceptions are supported by analysis in the planning report.
4. Water conservation should be the first item considered among feasible water supply alternatives.
5. Population projects shall be based on Bureau of Business and Economic Research model, with any deviations from that model justified.

As part of Phase 3 of the Middle Rio Grande Water Supply Study, SSPA was tasked with providing specific technical assistance to the MRGPR and the SSPR. This assistance was to help the groups "develop the requisite understanding of the hydrology and water resources of their respective region necessary for the independent development of various water supply alternatives, and to evaluate the alternatives to ensure that they comply with the Compact" (MRGWSS Phase 3 Scope of Work). The SSPA Scope of Work excludes involvement in developing alternatives, as this is the function of the planning regions. Similarly, integration of technical evaluations into regional plans is the responsibility of the planning regions, as regional planning involves more factors than technical analysis. SSPA's role was limited to providing background information regarding supply, providing an assessment of the hydrologic impacts of the proposed alternatives, and evaluating each region's chosen water planning alternatives using the analysis tools described in this report. Results of this work are presented in Chapter 5.

2.2 Rio Grande Compact

Recognizing the need to formalize allocation of the Rio Grande among Colorado, New Mexico and Texas, in 1923, the U.S. Congress consented to negotiation of the Rio Grande Compact. The 1938 Rio Grande Compact was ratified by all three states and passed by the 76th Congress as Public Act No. 96 in 1939. The opening paragraph of the Compact summarizes its purpose and intentions:

> The State of Colorado, the State of New Mexico, and the State of Texas, desiring to remove all causes of present and future controversy among these States and between citizens of one of these States and citizens of another State with respect

> to the use of the waters of the Rio Grande above Fort Quitman, Texas, and being moved by considerations of interstate comity, and for the purpose of effecting an equitable apportionment of such waters, have resolved to conclude a Compact for the attainment of these purposes…. (McClure, T.M., M.C. Hinderlider, F.B. Clayton, and S.O. Harper, 1939. Rio Grande Compact.)

Among the Compact articles are specific delivery schedules, based on gaged stream flows and adjustments for storage of water in reservoirs. The delivery obligation of New Mexico is identified in Article IV. In this article, New Mexico's delivery obligation was scheduled based on flow conditions at Otowi, exclusive of the months of July, August and September. The original scheduled point of delivery was San Marcial, New Mexico, located upstream of the Elephant Butte Reservoir. (It should be noted that the Compact delivery point does not occur at the New Mexico – Texas stateline. Deliveries to "Texas" also serve New Mexico and Mexico users in the Lower Rio Grande basin of New Mexico).

The Compact schedule for New Mexico's delivery obligation was modified by a resolution in 1948 to incorporate the entire year and to change the location of the downstream index station. A revised delivery schedule was adopted, specifying the delivery obligation at Elephant Butte, based on conditions at Otowi. The delivery obligation at Elephant Butte is termed the *Elephant Butte Scheduled Delivery* (also sometimes termed *Elephant Butte Effective Index Supply*). The obligation is based on the annual value of the *Otowi Index Supply* (also sometimes termed *native inflow*). The Otowi Index Supply is defined as, "the recorded flow of the Rio Grande at the U.S.G.S. gaging station at Otowi Bridge… corrected for the operation of reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and Otowi Bridge." The resolution also indicates that the schedule is subject to adjustments for future changes in location of gaging stations, post-1929 depletions of the run-off above Otowi Bridge, and trans-mountain diversions. The difference between the Otowi Index Supply and the Elephant Butte Scheduled Delivery, plus surface or groundwater inflow between Otowi and Elephant Butte and San Juan-Chama transmountain diversion water, is the amount of surface water available for depletion in the Middle Rio Grande region. The relationship between Otowi Index Supply and Elephant Butte Scheduled Delivery is shown graphically on Figure 2.1. The percentage of the Otowi Index Supply that must be delivered at Elephant Butte increases with increasing water supply, ranging from 57% for a very low supply to over 86% for a very high supply year. The difference in Otowi Index Supply and Elephant Butte Scheduled Delivery reaches a maximum value of 405,000 acre-feet per year when the Otowi Index Supply exceeds 1.5 million acre-feet per year. In practical terms, the allocation of Otowi inflow to the Middle Rio Grande region is about 400,000 acre-feet in years with average or above-average supply, and less in years of below-average supply.

Other terms defined by the Rio Grande Compact include: the *Actual Elephant Butte Effective Supply*, which is the recorded flow of the Rio Grande at the gaging station below Elephant Butte Dam, adjusted for net changes in reservoir storage in the Elephant Butte Reservoir during the year; and the *Credit/Debit Balance*, which is the end of the year balance of *credits and debits* accrued under the Rio Grande Compact.

The Compact sets forth specific rules regarding the accumulation of credits and debits. No annual credits or debits are computed for years when a spill occurs from Elephant Butte Reservoir. Accrued credits spill first. Accrued debits are set to zero when water in excess of the accrued credits is spilled from storage.

Compliance with the Rio Grande Compact is mandated by law. Thus, the Compact has a definitive role in quantification of the regional water supply.

2.3 Concepts of Aquifer-Stream Interaction

In the Rio Grande Basin, groundwater is present at varying depths beneath the ground surface. The availability and suitability of groundwater in various locations depends on a number of factors, including the depth to groundwater, the quality of the groundwater, and the ease with which the aquifer yields groundwater to wells. These factors vary according to geologic conditions, land use, and intensity of groundwater withdrawals in an area. While the availability and suitability of groundwater is variable, all of the groundwater in the Quaternary alluvium and Santa Fe Formation (virtually all of the groundwater presently available to the Middle Rio Grande region) is considered to be *stream-connected*.

Conceptually, a stream-connected aquifer can be illustrated with a simple model of a bathtub filled with layers of gravel, sand, silt and clay, with a stream running across the surface from one end to the other. Consider the effect of removing water through a straw (a well) from the wetted gravel-sand-silt-clay (the aquifer) in the bathtub. The water level within the sands (and other sediments) of the tub, close to the straw, will be slightly lowered, and flow will be induced from the stream towards the straw. Likewise, the flow in the stream will be reduced and less water will flow out from the stream at the end of the tub. Similarly, in a stream-connected aquifer, pumping from wells in the aquifer will affect the flow of streams. Depending on the distance from the well to the stream, the geologic materials, and other factors, the effects of pumping on the stream may be immediate or may be delayed. For example, pumping effects from a distant or deeper well will be tend to be delayed, compared with pumping effects from a well closer to the river. Similarly, a well completed in sands and gravels will develop communication with the river more rapidly than wells completed in or beneath less permeable sediments, such as silt or clay. Regardless of the timing of impacts, eventually, the effects of pumping a stream-connected aquifer will be transmitted to the stream or river.

The impact on the river from pumping a stream-connected well increases with time until it reaches *steady-state conditions* and stabilizes. The steady-state reduction in stream flow may be less than 100% of the pumping rate if other sources or uses of water are intercepted. For example, pumping may result in decreased availability of shallow groundwater to plants, and a portion of the source may be attributed to *salvaged evapotranspiration*.

Before steady-state conditions are achieved, groundwater is partially obtained from storage. In other words, the amount of groundwater stored within pore spaces around the sand, gravel, or other aquifer materials, is reduced. As a result of the removal of groundwater from storage, the groundwater level is lowered, resulting in a *cone of depression* around the well or well field. While many consider the portion of pumped groundwater that is derived from storage to represent a source of water supply, separate from the stream supply, this characterization does not hold in a stream-connected aquifer unless pumping continues indefinitely. Once pumping ceases, the stream flow will continue to be impacted until the storage space is refilled. Thus, the original water obtained from storage is “borrowed”, to be repaid after pumping ceases.

The aquifers of the Middle Rio Grande region are stream connected. However, in the Albuquerque area, groundwater elevations have declined due to pumping and are presently below the elevation of the stream. Locally, the river and aquifer have become disconnected. This local disconnection results in additional delay in the time for pumping effects to be felt by the river. While local disconnection is an additional factor affecting the timing of pumping impacts on a stream, the characterization of aquifers in the Middle Rio Grande region as stream-connected remains functionally correct.

Because aquifers in the Middle Rio Grande region are stream-connected, the pumping of groundwater affects the Compact-limited water supply available to the region. In the long term, the groundwater resource functions as a regulating reservoir to the region, rather than as a separate source of water.

2.4 Water Budgets

The water budget describes the fundamental state of affairs for a hydrologic system. The water budget can be likened to a financial statement – quantification of inflows, outflows and changes in storage are analogous to income, expenses and changes in savings or mortgage balances. Quantification of the water budget is one of the primary activities conducted by hydrologists, resulting in a framework for evaluating water supplies and water use. Due to the value and limits of the water resource in the Middle Rio Grande region, the water budget has been studied and described by many investigators. Many of these studies have shed light on hydrologic processes, and have formed the basis for subsequent water resource policy.

The results of water budget studies from different investigations sometimes appear inconsistent. However, in many cases, water budgets address differently defined systems, different time periods, or have specific applications; hence, they are not amenable to direct comparisons with other water budgets. Regardless, the simplicity of the water budget invites comparison, and misunderstanding is not uncommon. In Phase 2 of this study, a review of several of the water budget evaluations found in the literature relating to the Middle Rio Grande region was undertaken. The water budgets were compared with respect to the study objective, spatial and time domains, physical domain and study approach. Profiles of each water budget study were provided in Appendix E of the Phase 2 report (SSPA, 2000) and provide a useful reference on this topic.

Through quantification of regional water inflows and demands, the regional water budget provides a foundation for regional water planning. This study presents a basin-wide water budget for the Middle Rio Grande region, delineated as described in Section 1.2. Elements of this basin-wide water budget can be applied by regional planners to their planning region, with some adjustments for non-coincident boundaries.

Water budgets are analytical tools that utilize estimates for many water budget terms. For this study, SSPA was directed to use best-available data in deriving a water budget. Original scientific study to quantify water budget terms was not within the scope of this study. Because available scientific data regarding water budget terms is evolving with time, the water budget likewise evolves. The water budget developed in Phase 2 (SSPA, 2000) has been supplanted with an updated water budget as described in this report, or, the Phase 3 water budget. Several important water budget terms have been revised based on updated data and evaluations provided by the U.S. Bureau of Reclamation (USBR), the U.S. Geological Survey (USGS) and the New Mexico Office of the State Engineer (NMOSE) and the NMISC in the three years since work in the earlier phase was conducted. Significant uncertainty remains in the estimation of several large water budget elements. As scientific studies continue to refine the quantification of terms such as crop and riparian consumptive use and ungaged tributary inflows, the water budget will be subject to further refinement.

2.5 Concepts of Probability and Risk Analysis

Hydrology, the science of the occurrence and distribution of water in time and space, involves the description of water inflows to, outflows from, and changes in storage within defined hydrologic systems. These hydrologic processes can be described using laws of physics, although fluctuations in some of these processes are best described using laws of chance. If causative factors for a hydrologic process are well understood and amenable to characterization, then that hydrologic process can be described *deterministically.* On the other hand, if causative factors are not known, are too great in number, or are too difficult to characterize, a *stochastic,* or *probabilistic,* description can be useful in characterizing the process. Many hydrologic processes exhibit probabilistic behavior.

The native inflow at Otowi is an example of a hydrologic input that can be described probabilistically. Although influenced by climate (i.e., snowpack, precipitation, temperature, etc.), the causative factors leading to a high- or low-flow year are themselves difficult to predict. The science of probability offers tools for describing processes seemingly governed by laws of chance. Probabilistic approaches are used in this study to better characterize hydrologic processes influenced by climatic-induced variability.

The probabilistic tools used in this study include *descriptive statistics, probability distribution fitting, correlation analysis* and *risk analysis*. These are very briefly described below. The application of these methods in this study are described more fully in Sections 4 and 5 and in their associated appendices.

Descriptive statistics involve describing the nature of, and variability in, a population or set of events. These statistics address questions such as, what is the average, maximum, or minimum payout of a slot machine, and how often does it pay.

Probability distribution fitting involves finding a curve or mathematical formula to describe the likelihood of experiencing a particular set of outcomes. For example, casinos set slot machines to operate according to a probability distribution that will achieve the desired result: a few big wins are needed to attract customers; a larger number of small wins are needed to satisfy players; but, on average, the casino must make a profit to stay in business. A probability distribution, as seen in Figure 2.2, can be graphed as a histogram (bar graph showing how often the outcome will fall into a specific range) or a function (a curve related to the probability of various outcomes).

Correlation analysis involves quantifying the similarity between different processes, allowing us to numerically answer questions such as "If the Otowi native flow is high in a particular year, how likely is it that the flow of the Jemez River will be high?" The numerical correlation between two data sets, such as the Otowi Index Supply and the Jemez River flow for 1950-2002, is generally referred to as an "r-value", and expressed as r=0.86. This implies that 86% of the variability in the Jemez River flow 1950-2002 time-series graph is also seen in the Otowi Index Supply graph for the same period.

Risk analysis, sometimes called uncertainty analysis, is a method for considering the combined effects of multiple probabilistic, or uncertain, processes. Risk analysis is the first step towards managing risk. From a protective point of view, it seeks to answer the question, what is the probability of a disastrous combination of events occurring? Risk analysis is a common tool in many industries, including finance, insurance and health care. Applied to water supply evaluation, risk analysis involves combining the probability distributions of each hydrologic process to find a probability distribution describing the overall water supply. Taking the analysis a step further, and combining the supply with assumed depletions, this process can be used to develop a probability distribution of achieving Compact credit or debit under certain conditions.

2.6 Climate Variability in the Period of Record

The water budget analysis presented in this report is based on the 1950-2002 period. This period was chosen because it is representative of present-day development conditions and is relatively well documented in terms of stream flow data, crop and riparian acreage values, reservoir storage and evaporation data. However, this leaves the questions, "Is this period representative of long-term average conditions, does it contain extremes we should know about, either droughts or wet periods, and do we believe it will be indicative of future conditions?" Two tools are applied to address these questions: tree ring records and climate forcing.

2.6.1. Tree ring reconstructions of past climate

Though measured stream flows in the Middle Rio Grande valley extend back no further than the late 1800s, tree-ring records can be used as a proxy for hydrologic and/or climatic conditions over the past 2000 years, allowing us to view the 1950-2002 period of record within the context of the historic regional climate. Two recent tree-ring climate reconstructions are available for the Middle valley, the El Malpais precipitation reconstruction (Grissino-Mayer, 1996), and the Middle Rio Grande Basin Palmer Drought Severity Index (MRG PDSI) reconstruction (Grissino-Mayer et al, 2002). The El Malpais precipitation reconstruction is based on Douglas fir and ponderosa pine found in the El Malpais National Monument near Grants, New Mexico (Figure 2.3), and covers 2,129 years from 136 B.C. to 1992 A.D. The MRG PDSI reconstruction is based on 3 tree-ring records: the El Malpais record, a record from the Magdalena Mountains west of Socorro, and a record from the Sandia Mountains east of Albuquerque. Conjunctively using records from all three sites, Grissino-Mayer et al. (2002) reconstructed the PDSI for New Mexico climate division 5, the Middle Rio Grande basin, for a period of 1,371 years from 622-1992 A.D. For both of these tree ring reconstructions, the author(s) has provided extensive analysis and ranking of drought and wet periods.

The analysis presented with the El Malpais reconstruction, though focused primarily on long-term (>100 year) trends, touches on decadal events. Grissino-Mayer (1996) notes "A long-term, above normal rainfall pattern began ca. AD 1791 and has lasted into the current century…. The reconstruction shows that two short-term drought periods occurred during AD 1890-1904 and AD 1945-1958. In general, however, rainfall during the last 200 years has been above normal, and has been steadily increasing since the early 1700s." This can easily be seen in Grissino-Mayer's (1996) Figures 4A and 4B, reproduced for this report as Figure 2.4A and 2.4B. Figure 2.4A shows the reconstructed annual rainfall in standard deviation units (above 1 indicates annual precipitation above the 84^{th} percentile; below –1 indicates annual precipitation below the 16^{th} percentile) smoothed with a 10-year spline that emphasizes decadal-scale climatic events. The 1950s drought can be easily seen as an extended period of values at or below –1 standard deviation units. Grissino-Mayer et al. (1997) rank the 1950s drought as the 19th most severe drought for the El Malpais in the 2,129-year record. Figure 2.4B shows the same data, smoothed with a 100-year spline that emphasizes century-scale events. Here, it is clear that climate since the 1800s has been extremely wet. However, even on a century-scale, the 1950s drought is clearly evident.

The analysis of the PDSI reconstruction for the Middle Rio Grande Basin focuses on events of 5 or more years. In their analysis, Grissino-Mayer et al. (2002) state "The reconstruction revealed over 60 multi-year periods (each >5 years in length) of either severe drought or extreme wetness. Notable among these were the five driest periods between 1571-1593, 1272-1297, ***1945-1963***, 701-712, and 1131-1151. The five wettest periods occurred between 1553-1557, 1627-1653, ***1978-1992***, 724-733, and 1377-1396." The extremity of both the 1950s drought and the extreme wet period post 1978 can be seen in Figure 2.5, which shows the MRG reconstructed PDSI, smoothed with a 10-year running average.

Data from the 1950-2002 period can be easily used to represent a wide range of climatic conditions. Both of the climate reconstructions show that the 1950s drought was a severe drought within the context of the past 1400-2100 years. They also show that MRG climate since the late 1970s has been wetter than anything previously on record. Fortunately, the 1950-2002 period also well-represents long-term average conditions. Table 2.1 shows the 1950-1992 and 622-1992 averages for both the El Malpais precipitation and the MRG PDSI reconstructions. The 622-1992 and 1950-1992 average PDSI are both equal to or nearly zero. The 622-1992 average annual precipitation is 14.59 inches; the 1950-1992 average annual precipitation is 15.49 inches. Clearly, for both reconstructions, particularly the PDSI, the 1950-1992 average is equal to the long-term average. The 1950-1992 and 1950-2002 periods also appear similar climatically. The Otowi Index Supply for 1950-1992 averaged 933,191 acre-feet per year; the Otowi Index Supply for 1950-2002 averaged 931,945 acre-feet per year.

In summary, the 1950-2002 period includes both a severe drought and an extreme wet period, and when averaged over the 52 years, represents long-term average conditions well.

2.6.2. Climate forcing and the Pacific Decadal Oscillation

Climate forcing can be used to look for climate cyclicity, which may provide an indication of upcoming conditions, though it does not constitute a climate prediction. It is generally accepted that New Mexican climate and precipitation are strongly influenced by El Niño/Southern Oscillation (ENSO) effects. Precipitation is frequently significantly above normal during El Niño years, and La Niña years are strongly correlated with drought.

New Mexican climate and precipitation are similarly influenced by Pacific Decadal Oscillation (PDO) effects. The Pacific Decadal Oscillation is a long-lived El Niño-like pattern of Pacific climate variability. The two climate oscillations, PDO and ENSO, have similar spatial climate fingerprints, but they have very different behavior in time. 20th century PDO "events" persisted for 20-to-30 years, while typical ENSO events persisted for 6 to 18 months.

The Pacific Decadal Oscillation is derived from monthly sea surface temperature anomalies in the North Pacific Ocean, poleward of 20 degrees latitude. Just as ENSO climatic variations occur as a result of anomalously warm and cool pools of water in the equatorial Pacific Ocean, PDO climatic variations occur on a decadal time scale as a result of anomalously warm or cool sea surface temperatures in the North Pacific Ocean, and over a larger spatial scale than ENSO. The North American climate anomalies associated with PDO are broadly similar to those connected with El Niño and La Niña, though generally not as extreme. Positive (warm, with warm water off the west coast of the Americas) phases of PDO are correlated with El Niño-like North American temperature and precipitation anomalies, while negative (cold, with cool water off the west coast of the Americas) phases of PDO are correlated with La Niña-like climate patterns (Mantua, 2000). As with ENSO, there is a strong correlation between the Pacific Decadal Oscillation and precipitation in New Mexico, with increased precipitation during the warm phase and decreased precipitation during the cold phase. During the last cold phase of the cycle (1947-1976) dry years outnumbered wet years[1] nearly four to one (55 to 15 percent of the years). During the warm phase of the cycle (1977-1997) wet years outnumbered dry ones three to one (43 to 14 percent) (Liles, web site).

The correlation between severe regional droughts in New Mexico and the cool phase of the PDO is strong. Figure 2.6 shows the reconstructed Pacific Decadal Oscillation index from 1650-1991 (Biondi et al., 2001), and severe regional droughts in the Middle Rio Grande region of New Mexico (Scurlock and Johnson, 2001). As can be seen, all 6 of the extended droughts that have occurred since 1650 have coincided with cool (negative) phases of the PDO. In particular, droughts have occurred during 4 of the 6 most negative (cool) excursions of the PDO.

Cool PDO regimes prevailed from 1890-1924 and again from 1947-1976, while warm PDO regimes dominated from 1925-1946 and from 1977 through the late-1990s. These periods correspond to the two periods of extended drought and two periods of above average moisture experienced by New Mexico in the past 100 years. Average

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[1] For both, "wet" and "dry" indicate years with precipitation 10% above or below the average precipitation measured from 1944 to 1997.

Otowi Index Supply for the latter three of these periods, shown in Table 2.1, illustrates the relationship between PDO phase and flow of the Rio Grande.

There is scientific evidence that the PDO shifted around 1998-1999 and we have entered the cool phase. If true, then New Mexico could be at the start of a 20-year extended period of drought, possibly similar to the 1950s drought.

2.6.3. Implications for the Middle Rio Grande Basin

Based on review of past climate, as captured in tree ring records, and of the climate forcing impact of the Pacific Decadal Oscillation in the Middle Rio Grande Basin, we can conclude the following:

- The 1950s drought, from 1945-1963, was the 3rd most severe drought of the past 1,371 years, equaled in its magnitude and duration only by the droughts between 1272-1296 and 1571-1593. (Based on the El Malpais precipitation reconstruction, the 1950s drought was the 19th ranked drought, in severity and duration, during the past 2,129 years);
- The 1978-1992 period is the third wettest multi-year period in the 1,371 year reconstruction (for the El Malpais precipitation reconstruction, the 1978-1992 period is ranked the wettest period of the last 2,129 years);
- Based on 20th century correlations between the PDO and MRG Basin drought and wet events, the apparent switch in the PDO in 1998 to it's cool phase would suggest extended drought conditions are returning to New Mexico.

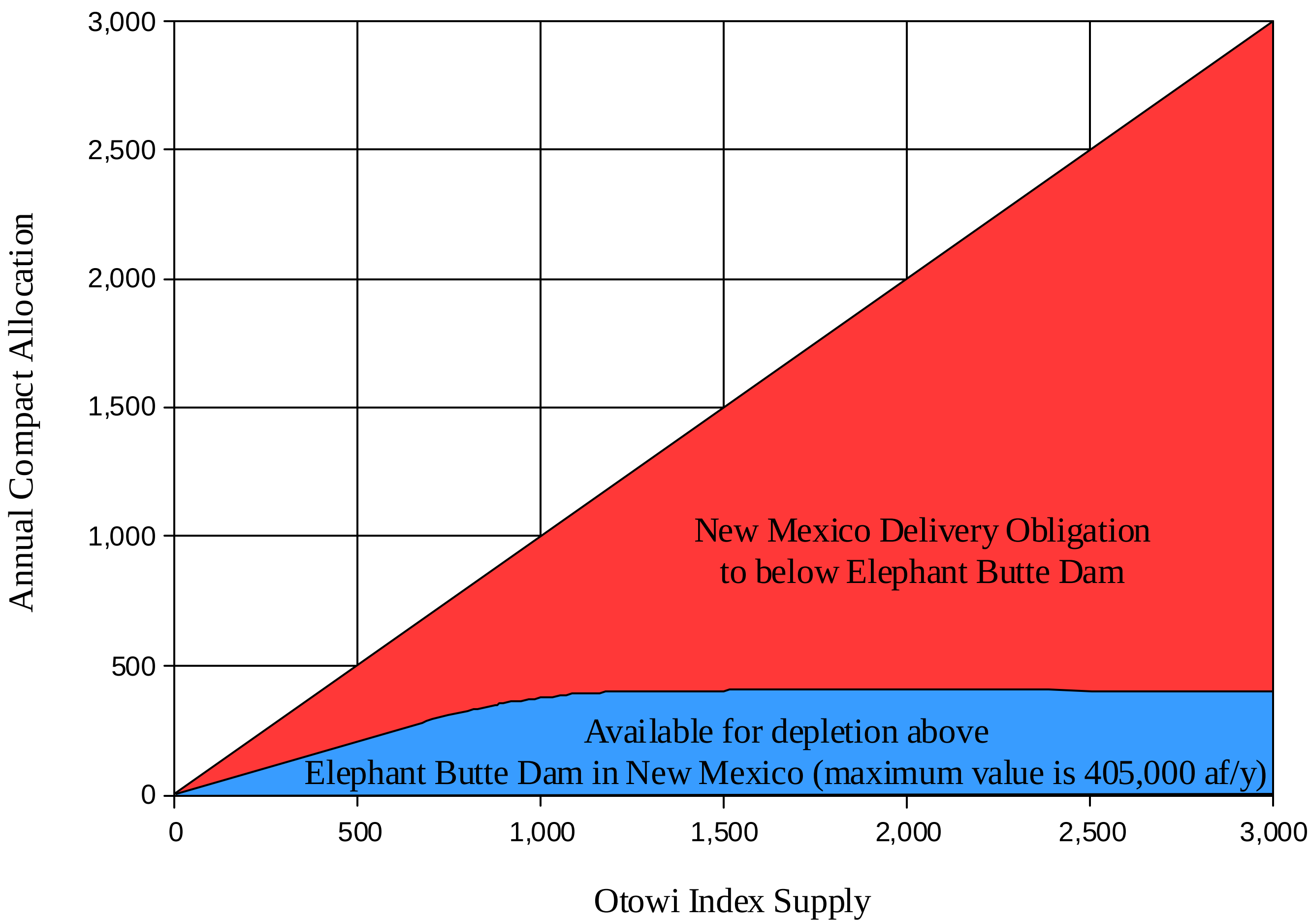
These conclusions imply that:

- The 1950s drought is an excellent period to work with for drought planning for the Middle Rio Grande Basin.
- In choosing a period of record to work with in preparing water budgets for the region, the 1950-2002 period is preferable to a shorter period during the same time span. Though on an annual basis, the 1950-2002 period includes an abundance of wet and dry years, and relatively few "average" years, when averaged over the 53 years of record, this period fairly well represents "average" conditions.
- Use of a shorter period of record for planning analyses, particularly the more recent 25-year period, should be done only with the recognition that this period has been significantly wetter-than-average. Without some adjustment for this bias in the record, water supply projections developed from the past quarter century will likely overestimate the long-term water supply.

Figure 2.1

Rio Grande Compact Allocation

(quantities in thousands of acre-feet)



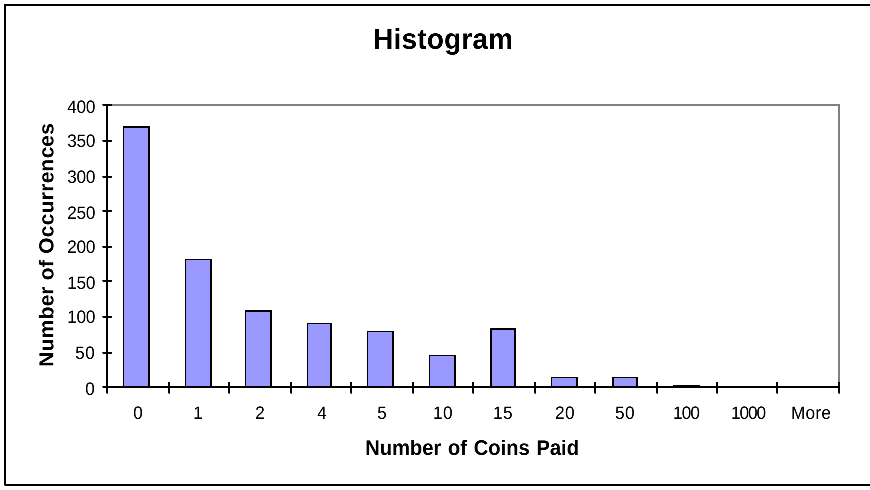
Tabulated values from Resolution Adopted by Rio Grande Compact Commission, 1948

(Quantities in thousands of acre-feet)

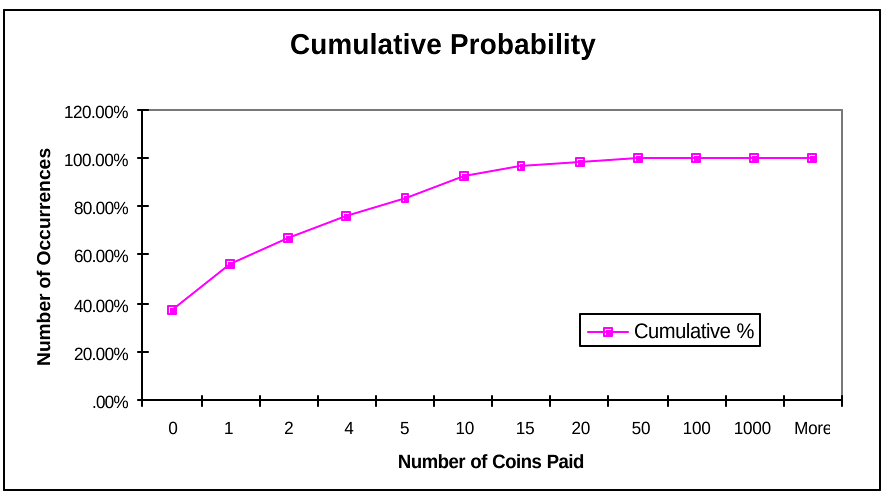
Otowi Index Supply	Elephant Butte Scheduled Delivery	Otowi Index Supply	Elephant Butte Scheduled Delivery
100	57	1,600	1,195
200	114	1,700	1,295
300	171	1,800	1,395
400	228	1,900	1,495
500	286	2,000	1,595
600	345	2,100	1,695
700	406	2,200	1,795
800	471	2,300	1,895
900	542	2,400	1,995
1,000	621	2,500	2,095
1,100	707	2,600	2,195
1,200	800	2,700	2,295
1,300	897	2,800	2,395
1,400	996	2,900	2,495
1,500	1,095	3,000	2,595

Figure 2.2

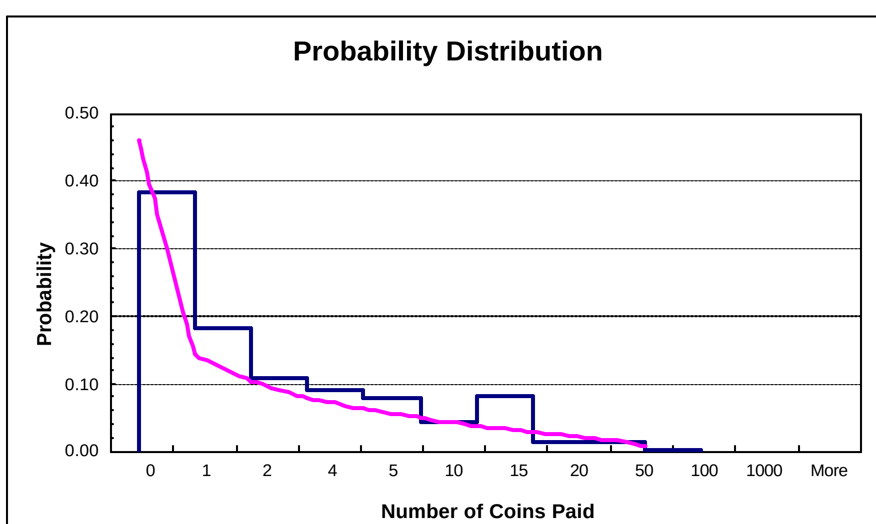
Probability Distribution Example



A histogram, is a type of bar graph which shows how often the outcome will fall into a specific range. (Here, how often a certain number of coins will be paid.)



A curve, or function, can be used to show the likelihood of experiencing a particular outcome. (Here, the likelihood of a certain payout.)



The probability distribution graph includes a histogram and a function of the predicted probable outcomes.

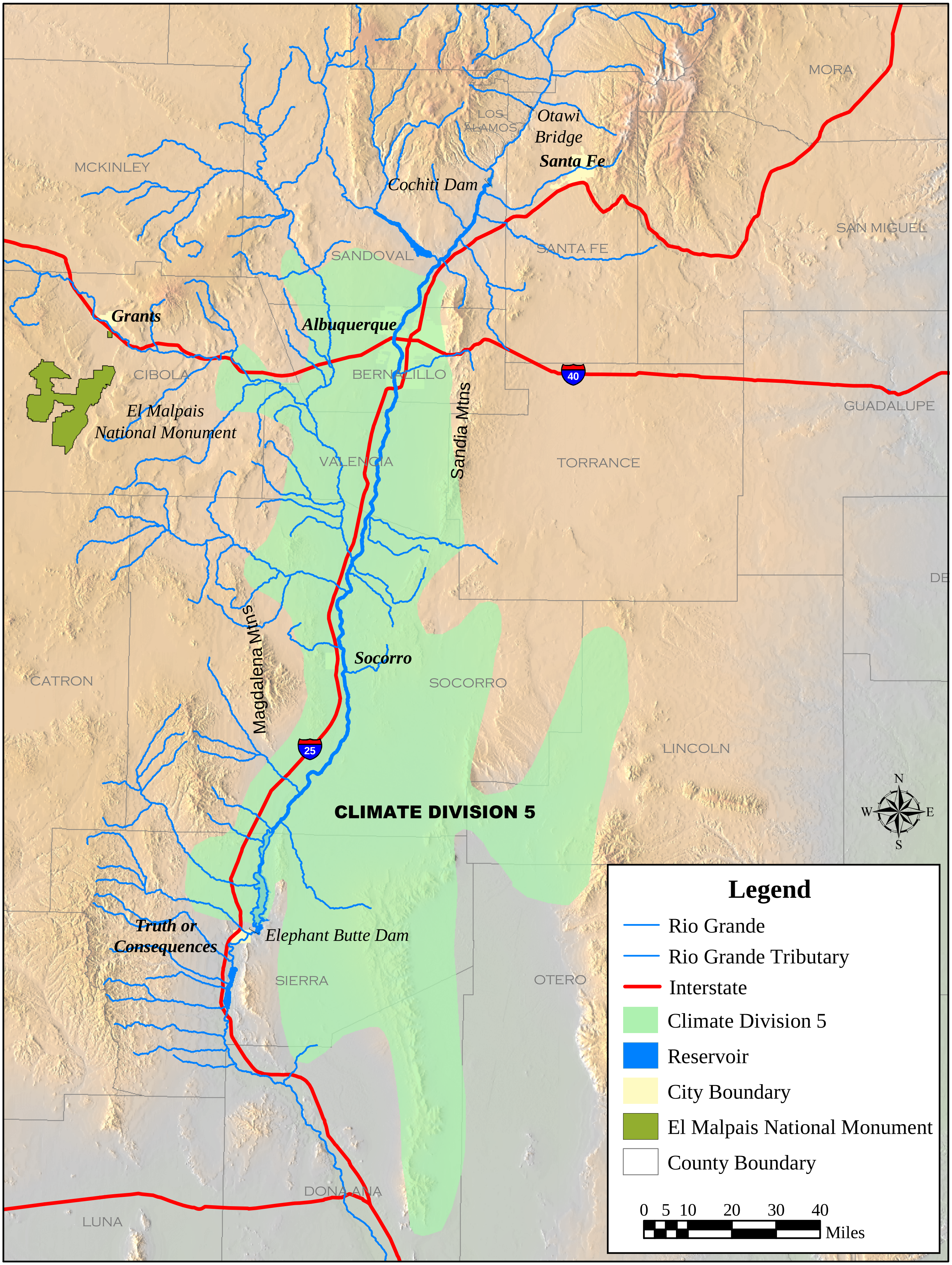


Figure 2.3. New Mexico Climate Division 5 and tree sampling sites

Figure 2.4
El Malpais precipitation reconstruction, in standard deviation units
A) Smoothed with a 10-year spline.
B) Smoothed with a 100-year spline.

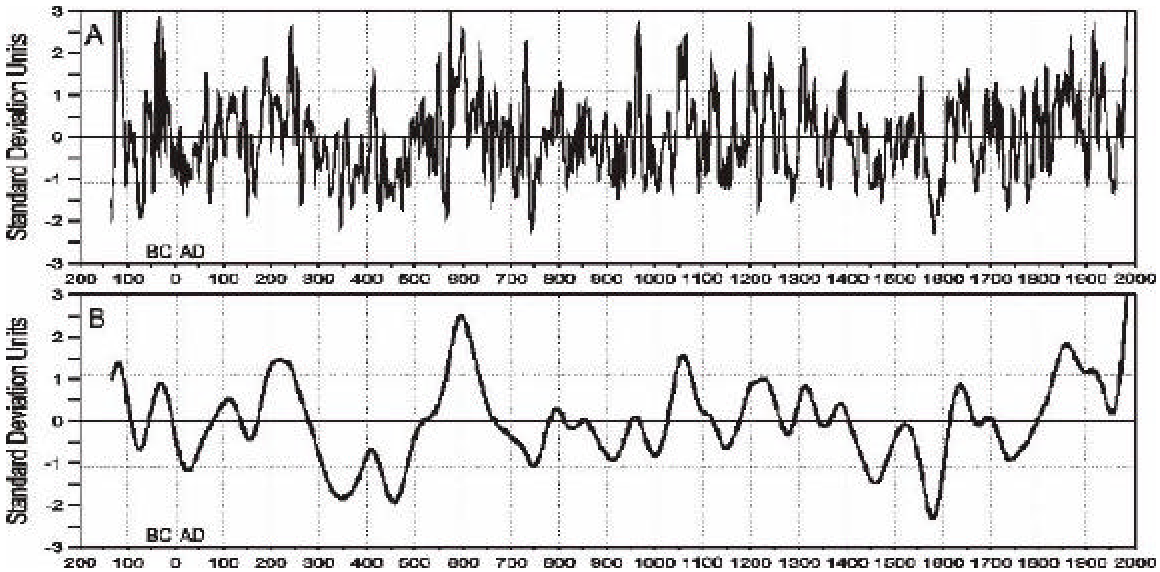
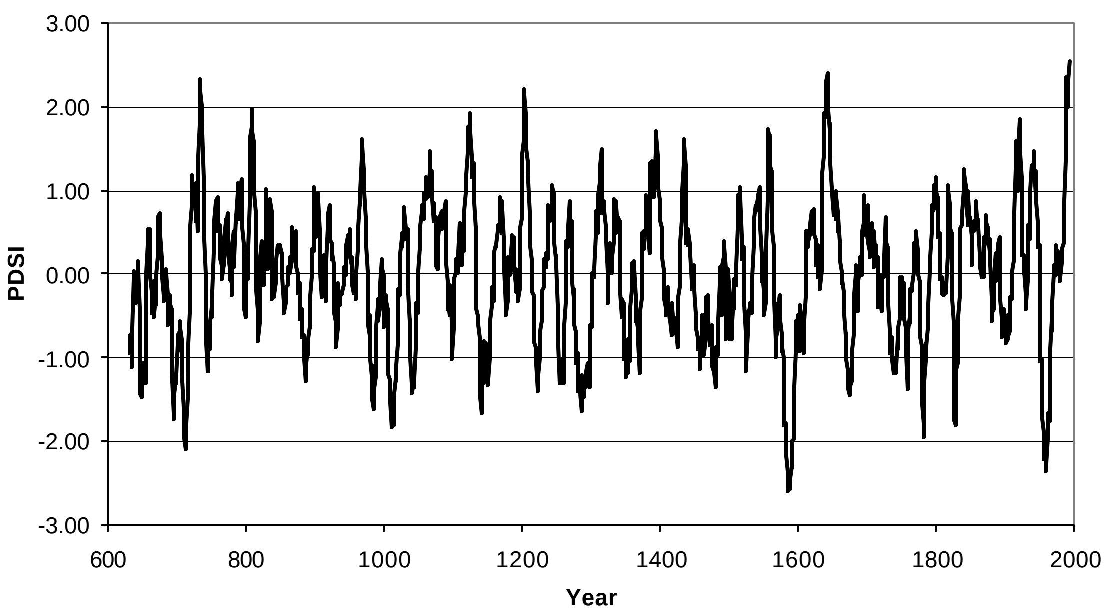


Figure from Grissino-Mayer, 1996

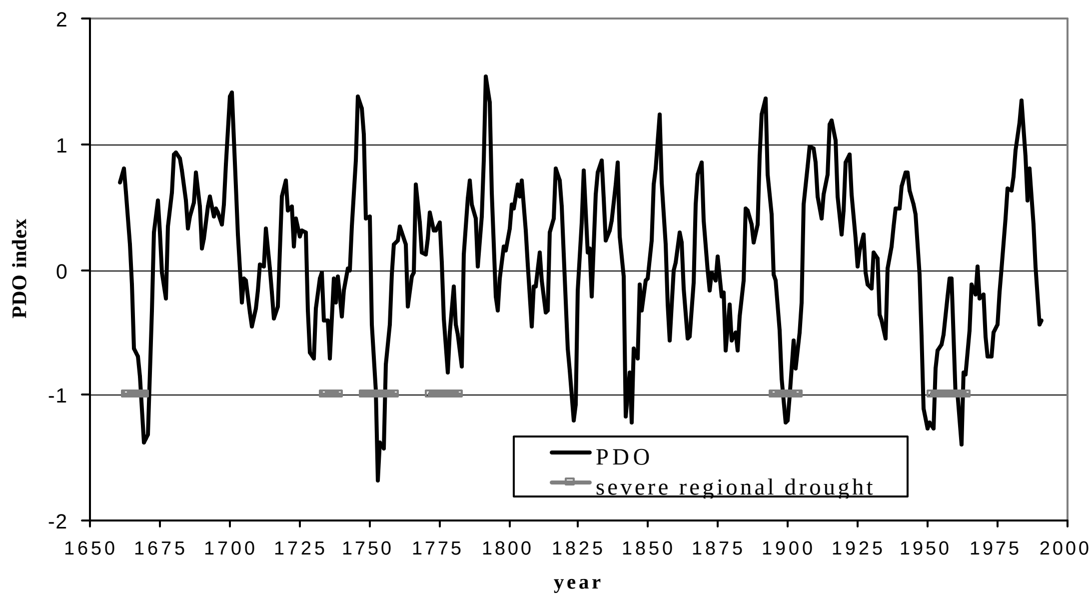
Figure 2.5
Middle Rio Grande Basin Palmer Drought Severity Index reconstruction; smoothed with a 10-year running average.



Data from Grissino-Mayer et al., 2002

Figure 2.6

Pacific Decadal Oscillation and Severe Regional Droughts in the Middle Rio Grande Basin



Reconstructed Pacific Decadal Oscillation index (Biondi et al., 2001), and extended droughts in the Middle Rio Grande. (Scurlock and Johnson, 2001). (Data from http://www.ngdc.noaa.gov/paleo/pubs/biondi2001/biondi2001.html)

Table 2.1

Average Otowi index flow for selected periods during the 1900s.

Year	Average Otowi index flow	% of 1919-1998 average	PDO phase
1950-1998	1,058,096	100	
1925-1945	1,146,418	108	Positive (warm)
1947-1976	824,647	78	Negative (cool)
1977-1998	1,171,159	111	Positive (warm)

3.0 AVAILABLE DATA AND RESOURCES

The water resources of the Middle Rio Grande region have been studied for over a century. Previous water resource studies relate to water supply, water demand, water storage, water conveyance, flood control and environmental issues. The number of investigating entities and breadth of investigator perspectives underscores the importance of water resources to this region.

Federal agencies conducting water resource evaluations in this region include the U.S. Geological Survey (USGS), the U.S. Bureau of Reclamation (USBR), the Army Corps of Engineers (COE), and the U.S. Fish and Wildlife Service. State agencies conducting water resource evaluations include the New Mexico Bureau of Mines and Mineral Resources, the New Mexico Interstate Stream Commission, the Department of Game and Fish, the New Mexico Office of the State Engineer, and the Environment Department. Other entities conducting studies include the Middle Rio Grande Conservancy District (MRGCD), the City of Albuquerque and other municipalities, the Bosque del Apache National Wildlife Refuge, the University of New Mexico, the New Mexico Institute of Mining and Technology, Sandia National Laboratories, Kirkland Air Force Base, and several water planning regions, counties and environmental groups. Other key players in the region include the pueblos of Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia, Zia, Jemez and Isleta, and the Rio Grande Compact Commission, which is authorized by the Congress of the United States.

While previous studies have varied in focus and scope, in aggregate, they present a staggering amount of data and information on the water resources of the Middle Rio Grande. As part of this study, existing studies, reports and data sets were compiled and used in the analyses. The reports and data sets used in this work are discussed in the following sections.

3.1 <u>Data and Information Reconnaissance</u>

Data for Phase 3 analyses are based on the data sets and reports collected in Phases 1 and 2, and updated information where applicable. In Phases 1, Executive Steering Committee (ESC) members identified key studies and contacts for information on surface water, groundwater and water use in the Middle Rio Grande region. A data inventory survey form was distributed to ESC members and other contact persons to further identify information on available data and metadata. Follow-up interviews were conducted with agency representatives and key investigators regarding identified water resource data and studies. Key data sets and reports were requested and collected. The data and information gained during this reconnaissance phase were organized into a document database, a series of data sets, and a metadata database. For Phase 3, a key subset of these data sets was updated through the end of 2002. Where appropriate, revisions to source material and additional reports were included in the analyses.

3.2 Annotated Bibliography

The annotated bibliography was updated in this study phase to include new reports and reports pertaining to climate studies. The bibliography contains key documents related to the Middle Rio Grande region in the areas of surface and groundwater modeling; water budget studies and depletion analyses; hydrogeology, geology, water resource planning, management of biological resources, river operations, and regional paleo-climatology. A subset of this bibliography includes annotations summarizing report contents. The bibliography is accessible through the project website, at **http://www.ose.state.nm.us/water-info/mrgwss/index.html**.

3.3 Metadata Database

Metadata, or data about data, was requested from agencies or entities collecting or maintaining water resource data with relevance to this study. A metadata database was compiled in Phase 2 of this study. Metadata were catalogued and assimilated into broad categories as established by the Federal Geographic Data Committee (FGDC). These categories include identification information, data quality information, spatial data organization information, spatial reference information, temporal data information, entity and attribute information, distribution and metadata reference information. Data sets included within the metadata database are listed in Table 3.1. The metadata database, reflecting the Phase 2 work, is described in detail in Appendix A and is available for electronic access or download on the project website, at **http://www.ose.state.nm.us/water-info/mrgwss/index.html**.

Since the completion of Phase 2, some data described in the Phase 2 metadata database has been augmented by data origination entities through one or more of the following actions:

- Continued data collection and database maintenance: Gaged flow records and wastewater discharges are examples of data sets that continue to grow as additional data are generated.

- Installation of new gages resulting in new data locations: New data sets are being created with the addition of new flow gages. Most notable in this category are numerous additional gages installed by the MRGCD in the period between 1999 and 2003. These gages, identified on Table 3.2, have been installed with the objective of measuring all inflows to and outflows from the MRGCD. The MRGCD expects to continue to expand this network of gages over the coming years to better understand the irrigation system water budget and to support efforts for improved system efficiencies.

- Revision of data in public databases: For example, the USBR has recently conducted QA on the ET Toolbox reported consumptive use numbers, and has made changes to reported historic consumptive use.

- Updated scientific studies: For example, the USGS has developed a new groundwater model for the Albuquerque Basin, published in 2003.

A comprehensive update of the Phase 2 metadata database was not included in the scope of work for the Phase 3 study, however, where applicable to the Phase 3 analyses, updated or replacement data and metadata have been obtained. These data are identified and discussed in the following section.

3.4 Key Data Sets

Key data sets used in the Phase 3 study are described in this section, under the general categories of USGS flow data, wastewater discharge, Rio Grande Compact indices, *consumptive use* data and GIS coverages. These data sets are illustrated in Appendices B and C, which provide time-series plots of flow and consumptive use data. Figure 3.1 provides a schematic diagram indicating the relative location of selected gaging stations, major tributary inflows, and municipal wastewater returns in the study area.

3.4.1 USGS Flow Data

An initial review of *USGS gaging stations* identified 69 flow gaging stations within the Middle Rio Grande region that measure daily or peak discharge at river, canal, drain and tributary locations. From this list, active and discontinued stations were identified which met the following criteria:

- Stations on the Rio Grande, or adjacent canal, drain or other conveyance channels;
- Tributary stations at the most downstream (closest to confluence with Rio Grande) location monitored.

Stations on minor arroyos with gages at locations distant from the Rio Grande were excluded. The resulting set of 47 gaging stations is listed in Table 3.3, with identifying information and the period of record for the station. Metadata and time-series graphs of annual flow data calculated from the daily mean flows were provided in the Phase 2 report for most of these stations.

USGS gaging stations that are used in the basin-wide water budget include: Santa Fe above Cochiti Lake, Galisteo Creek below Galisteo Dam, Jemez River below Jemez River Dam, North Floodway, South Diversion Channel, Tijeras Arroyo near Albuquerque, Rio Puerco near Bernardo, and Rio Salado near San Acacia. These records have been updated through 2002 where possible. Time-series graphs of annual flow data calculated from the daily mean flows are provided in Appendix B for these 8 stations.

Other USGS gaging stations relevant to the basin-wide water budget include the Rio Grande at Otowi Bridge, the Rio Grande below Elephant Butte and the Rio Grande below Caballo. For the purposes of this study, adjustment of these records to account for changes in reservoir storage and for contributions of trans-mountain diversions is needed. Such adjustments are made annually by the Rio Grande Compact Commission, resulting in a secondary data set termed *Rio Grande Compact Data*. These data are discussed below in Section 3.4.3.

3.4.2 Wastewater Discharge

Monthly wastewater discharge records under Environmental Protection Agency (EPA) NPDES permits, for the municipalities of Albuquerque, Rio Rancho, Bernalillo, Los Lunas, Belen and Socorro, were obtained as electronic files from the EPA for the years of 1989 to 2002. The total wastewater discharge in 2002, comprised largely of wastewater from the City of Albuquerque, was 64,304 acre-feet. Time-series graphs of these records, as annual totals, are provided in Appendix B.

3.4.3 Rio Grande Compact-Based Indices and Records

The computed indices under the Rio Grande Compact include the Otowi Index Supply, the Elephant Butte Scheduled Delivery, the Elephant Butte Effective Supply and the End-of-Year Credit. These indices are published annually by the Rio Grande Compact Commission, along with the San Juan-Chama trans-mountain diversions. The definition and application of these indices are introduced in Section 2.2. Time-series graphs of each of these indices and the San Juan-Chama flows are provided in Appendix B.

The Rio Grande Compact indices control the useable supply to the Middle Rio Grande region. The Otowi Index Supply (native inflow) and the San Juan-Chama trans-mountain diversions represent the base upstream inflow to this region. This inflow, combined with surface water tributary inflow and net groundwater *gains/losses* in the Middle Rio Grande region, comprises the gross water supply to the region. The amount of water available for use within the Middle Rio Grande region, however, is determined after subtracting the downstream obligation, or Elephant Butte Scheduled Delivery, from the gross supply.

The Compact schedule sets forth a relationship between the Otowi Index Supply and the Elephant Butte Scheduled Delivery that provides for higher scheduled deliveries in years of higher flow. This relationship is not linear. Subtraction of the scheduled delivery from the Otowi Index Supply indicates that a maximum of 405,000 acre-feet per year is available for use within the Middle Rio Grande region (Figure 3.2). The actual supply to the region is equal to this difference, plus San Juan-Chama trans-mountain diversions, tributary inflow and net groundwater gains/losses.

The Compact credit or debit is calculated as the difference between the Elephant Butte Scheduled Delivery (the obligation) and the Actual Elephant Butte Effective Supply (representing the computed delivery), except in *spill years*, when no annual credit or debit is computed. Accrued credits and debits are set to zero when useable water is spilled from project storage. Figure 3.3 shows the history of credits and debits under the Rio Grande Compact. As seen in this figure, credits or debits were not computed for the spill years 1942, 1985 through 1988 and 1995.

Trans-mountain diversions of the San Juan-Chama Project were initiated in June 1971 to provide a supplemental water supply to contracting New Mexico entities. This Bureau of Reclamation project, authorized by Public Law 87-483, diverts water from three tributaries of the San Juan River in southwestern Colorado (the Navajo, Little Navajo and Blanco rivers), and delivers it through a series of tunnels across the continental divide to northern New Mexico. Project deliveries are measured at the mouth of Azotea Tunnel, which discharges into Willow Creek, a tributary to the Rio Chama. Project water is stored in Heron Reservoir on Willow Creek just above its confluence with the Chama. The total San Juan-Chama allocation, measured as releases from Heron Reservoir, is 96,200 acre-feet per year, of which 91,210 acre-feet per year is presently contracted. Included in this amount is 70,400 acre-feet per year contracted to entities within the Middle Rio Grande region, 5,605 acre-feet per year contracted to the City of Santa Fe and 5,000 acre-feet per year to maintain the recreation pool at Cochiti Lake, for a total contracted quantity for use between the Otowi gage and Elephant Butte of 81,005 acre-feet per year (NMISC, personal communication). San Juan-Chama water delivered for use in the Middle Rio Grande region is assessed a 2% conveyance loss between Heron Reservoir and the Otowi gage, as approved by the Rio Grande Compact Commission in 1979.

3.4.4 Consumptive Water Uses

Consumptive water uses in the Middle Rio Grande region include *evapotranspiration* by irrigated crops and riparian species; open water evaporation from the river, conveyance channels and reservoirs; and consumption of water for domestic, municipal and industrial use. Data sets for these consumptive uses have been obtained from sources described below, and are further documented in the metadata database

(Appendix A). Graphs summarizing data sets of consumptive use are provided in Appendix C.

3.4.4.1 Agricultural Consumptive Use

For six reaches in the region between Cochiti and San Marcial (Figure 3.4), daily consumptive use estimates for the years 1975 to 2002 are accessible through the USBR ET Toolbox web page at **http://www.usbr.gov/pmts/rivers/awards/ettoolbox.html**. These consumptive use estimates have been calculated by the USBR for mapped crops and riparian species within individual 4 km by 4 km cells corresponding to the National Weather Service Hydrologic Rainfall Analysis Project (HRAP) grid. For each cell, the USBR provides a term identified as "consumptive use", obtained by calculating daily potential evapotranspiration (ET) rates for each vegetation class using a modified Penman procedure, updated crop coefficients, and an updated solar radiation function (Al Brower, personal communication, May 2000). Crop and vegetation acreages are multiplied by their respective ET rates to calculate total daily consumptive use for each cell, and cells are summed to provide reach totals. In the calculation employed by the USBR for the ET Toolbox, uniform crop coefficients and vegetation acreages are employed, but climatic parameters are varied according to the climatic record.

Crop and vegetation acreages are based in part on the 1992 condition, calculated by the USBR utilizing aerial photography and 1992 Landsat TM satellite imagery, in coordination with a program of field verification. The acreages derived from this work were compiled by the USBR into a GIS database and are commonly referred to as the 1992 LUTA (land use trend analysis). This work is documented in the Middle Rio Grande Water Assessment Supporting Document No. 13 (Bell, et. al., 1994). The resulting GIS coverages were subsequently updated by the USBR to extend into areas to the south, and these extended land use coverages are available from archives at the Earth Data Analysis Center (EDAC). Metadata regarding the methods, date and other details of the land use extension have not been located. This combined coverage including the 1992 LUTA and the subsequent (undated) extension will be referred to as the 1992 LUTA/Extended land use coverage.

For this study, agricultural irrigated acreage for the reaches between Cochiti and San Marcial (reaches 1 and 3–6) were extracted directly 1992 LUTA/Extended GIS coverages obtained from EDAC[1]. These acreages were then used, in conjunction with reach-averaged potential ET rates (for the 1975-2002 period) derived from the ET Toolbox (January 2003 version) data, to calculate consumptive use (potential ET) values for each reach.

The average values for irrigated acreage and potential evapotranspiration rate, and the resulting calculated potential crop consumptive use, used in this study are shown in Table 3.4. These values include both irrigated lands within the MRGCD as well as other irrigated areas, for example areas irrigated by the La Joya Acequia, that reside outside of the boundaries of the MRGCD. Fallow and idle acreage is not included in the acreage totals. 1,706 acres of irrigated land within the Bosque del Apache are included within the San Acacia to San Marcial reach[2]. There is no irrigated agricultural acreage reported between San Marcial and the north end of Elephant Butte Reservoir. Consequently, ET Toolbox Reach 7, *San Marcial to Elephant Butte Reservoir*, is not included in these calculations.

The calculated consumptive use presented in Table 3.4 represents the potential, or theoretical, consumptive use for these crops, under the given climatic conditions, and assuming that optimal growth conditions are present. In reality, this level of use will not be obtained; actual consumptive use will reflect less than optimum growth conditions. An adjustment from potential to actual consumptive use for the water budget analysis is described in Section 4. Additionally, a portion of the consumptive use is supplied by precipitation, reducing the consumptive use that must be satisfied through irrigation (*consumptive irrigation requirement*). The ET Toolbox does not provide the estimated consumptive irrigation requirement, although a term labeled "daily water use" is provided. The "daily water use" provided in the ET Toolbox is not equivalent to a

[1] These GIS coverages are used in lieu of acreages reported in the ET Toolbox, reportedly obtained by similar procedure from the same source material. Directly extracted values were not identical to those reported in the ET Toolbox, though total acreage for the entire Middle Rio Grande from Cochiti to San Marcial was nearly identical to that given in the ET Toolbox. At least some of the reach-by-reach difference is believed to be associated with the cell discretization utilized for the ET Toolbox. Although the ET Toolbox numbers are based on the LUTA/Extended data, the data is clipped to represent a slightly smaller grid than the original coverage, and land use is totaled by grid cell. At the reach breaks, cells that span two reaches are put in one of the two reaches.

[2] As shown in Table 3.4, the total irrigated acreage between Cochiti and San Marcial is 63,500 acres. If the Bosque del Apache acreage is removed, the remaining acreage is 61,794 acres, roughly equal to that presented in other studies for this region.

consumptive irrigation requirement, because of the procedure employed whereby *all* daily precipitation is subtracted from the daily consumptive use, resulting in negative daily water use where precipitation exceeds the consumptive use. Accordingly, a separate "effective precipitation" term is included in the water budget and modeling (Section 4.3.12).

Graphs showing the annual crop consumptive use used in the Phase 3 analyses are provided in Appendix C. The updated Phase 3 cropped acreages, potential evapotranspiration rates and potential consumptive use are not substantially different from the values obtained for Phase 2 of this study. However, as noted above, the consumptive use applied in the water budget analysis is adjusted to represent an estimate of "actual" versus "potential" consumptive use. This adjustment (Section 4) results in a significant reduction of agricultural demand in the basin-wide water budget.

3.4.4.2 <u>Riparian and Open Water Consumptive Use</u>

Riparian and open water acreage and potential consumptive use are treated as separate terms to facilitate assessment of planning alternatives that deal with only riparian or only open water. As for the agricultural acreage, riparian and open water acreages for reaches 1 and 3 – 6 were extracted directly from the 1992 LUTA/Extended GIS coverages archived by EDAC. The acreage in the *San Marcial to Elephant Butte Reservoir* reach (reach 7) was taken directly from the ET Toolbox and represents interpretation of IKONOS 2000 satellite imagery. Potential evapotranspiration rates were taken from the January 2003 ET Toolbox data for the reaches between Cochiti and San Acacia (reaches 1 and 3-5) and were averaged over the 1975 to 2002 period. For Reach 6, the average ET Toolbox riparian evapotranspiration rate was unexpectedly small, 3.03 acre-feet per acre. Given that the riparian vegetation in reach 6 is predominantly salt-cedar, and that the latest salt-cedar studies in New Mexico suggest that consumptive use is 4 acre-feet per acre (King and Bawazir, 2000; Bawazir, personal communication), an ET rate of 4 acre-feet per acre was used for Reach 6[3]. This rate was also used for Reach 7, which is also predominantly salt cedar.

[3] The ET Toolbox uses one set of crop coefficients for Reaches 1-5, corresponding to a combined salt cedar and cottonwood acreage. Reach 6 is based on the 1999 USBR/US Fish and Wildlife Service GIS, which individually tallies salt cedar and cottonwood acreages. Consequently, for Reach 6 of the ET Toolbox, the

Tables 3.5 and 3.6 present the riparian and open water acreages, evapotranspiration rates, and potential consumptive use updated for Phase 3 of this study. There are significant differences between the reach-specific estimates of riparian and open water consumptive use obtained for this phase, and estimates obtained for Phase 2 (SSPA, 2000). The Phase 3 estimates of riparian and open water acreage for the *Central Avenue to Bernardo* and *San Acacia to San Marcial* reaches are substantially larger than those obtained from the ET Toolbox for Phase 2 of this study. The changes from values used in Phase 2 reflect revisions made to the ET Toolbox by the USBR in the past year.

As for the agricultural consumptive use, effective precipitation is not included in the riparian and open water consumptive use calculations. Graphs showing the annual riparian and open water consumptive use used in the Phase 3 analyses are provided in Appendix C.

3.4.4.3 Reservoir Evaporation

Reservoir evaporation represents a significant consumptive use in the Middle Rio Grande region. Calculated reservoir evaporation for Cochiti Lake, based on pan evaporation, climate data and reservoir area, was obtained from the U.S. Army Corps of Engineers. Evaporation from Cochiti Lake typically ranges between 5,000 and 8,000 acre-feet per year; however, evaporation in the range of 15,000 to 20,000 acre-feet per year was reported for the wet years 1985 through 1987. Evaporation for the Elephant Butte Reservoir is similarly calculated by the USBR. Evaporation from Elephant Butte Reservoir is highly variable due to the large range of surface area. Evaporation has ranged from less than 50,000 acre-feet per year to over 250,000 acre-feet per year during the past 50 years. These values do not include evaporative losses from the exposed portions of the reservoir, however. This is discussed further in Section 4.4.5.

Metadata for reservoir evaporation data is included in Appendix A; time-series graphs are include in Appendix C.

USBR obtained a second set of crop coefficients from Dr. Bawazir to calculate potential consumptive use for the two riparian types separately (Al Brower, USBR, personal communication). Given that these alterations result in consumptive use values significantly below those reported in the literature, and as obtained directly from Dr. Bawazir, we have chosen to use the literature values directly.

3.4.4.4 **Groundwater Use**

Groundwater use in the Albuquerque Basin was not independently evaluated as part of this study. Recent work has been conducted by the USGS to catalogue groundwater withdrawals as part of the USGS Middle Rio Grande study. This information has been incorporated into the USGS model of the Albuquerque Basin (McAda and Barroll, 2002). As represented in the 2002 USGS model, the current level of pumping in the Albuquerque Basin, from Cochiti Dam to San Acacia, is 150,474 acre-feet per year. Municipal pumping between San Acacia and San Marcial, as obtained from pumping reports from the City of Socorro and New Mexico Tech, was an additional 3,300 acre-feet per year for 2002. No records are available to allow quantification of agricultural pumping below San Acacia.

Other elements of the water budget with respect to the groundwater reservoir are incorporated through groundwater flow models. For example, precipitation is incorporated through the modeled recharge terms, and groundwater basin inflow and outflow are incorporated through model boundary designations. This study did not re-examine the hydrogeologic conditions or groundwater budget incorporated into available groundwater flow models.

For the Albuquerque Basin, this study used the USGS groundwater flow model (McAda and Barroll, 2002). This model is used to integrate and represent groundwater processes and aquifer-stream interactions. The groundwater model is a work product of long-term studies of the Middle Rio Grande Basin, undertaken by the USGS and cooperating agencies. Future changes to the model will likely occur, incorporating additional data as they are generated. The USGS Middle Rio Grande Study and work products are summarized at **http://nm/water.usgs.gov/publications/abstracts/wrir02-4200.html** .

For the Socorro Basin, this study used an interim version of the NMISC Socorro Basin model presently under development (Shafike, 2003, personal communication). This model was used to assess aquifer/stream interactions associated with municipal pumping in the Socorro area.

3.4.5 GIS Coverages

GIS *coverages* of vegetation, hydrography, geology, land use, transportation features, and property and municipal boundaries are available from many agencies. As part of the Middle Rio Grande Water Assessment (Hansen, and Gorbach, 1997) the USBR prepared coverages for county and MRGCD divisions. These coverages are available through the Earth Data Analysis Center (EDAC) in Albuquerque, a data clearinghouse for geographic data sets. The USBR produces and maintains other coverages, for example, geomorphology and flood related coverages that were not used in this study and have not been catalogued.

GIS coverages prepared by the USGS for use in developing the groundwater model of the Albuquerque Basin (Kernodle et al, 1995; McAda and Barrol, 2002) include hydrography, land cover, topography, faults, aquifer properties, recharge and water well locations for the State. Many of these coverages are not readily available and are considered internal working products. Other coverages including hydrography, land survey and geology are available to the public through the Earth Sciences Information Center as digital elevation models (DEM), digital line graphics (DLG) and digital *raster* graphics (DRG).

Other agencies collecting or maintaining GIS coverages include the Natural Resources Conservation Service (soil maps), the MRGCD (parcel boundaries and irrigation diversions), the U.S. Army Corps of Engineers (various, a catalogue of coverages is under development), the Environmental Protection Agency (watershed boundaries), and the Interstate Stream Commission. Digital orthophotos and satellite imagery coverages exist for much of the study region. Many GIS coverages are created for specific agency needs and are of unknown or undocumented quality and are not accompanied by adequate metadata.

GIS coverages obtained for use in this study are included on Table 3.1. In many cases, coverage-specific metadata were unavailable, rather, generalized metadata were applied to related sets of coverages.

Figure 3.1

Schematic of Major Diversions and Tributary Inflows:
Rio Grande from Otowi to Elephant Butte

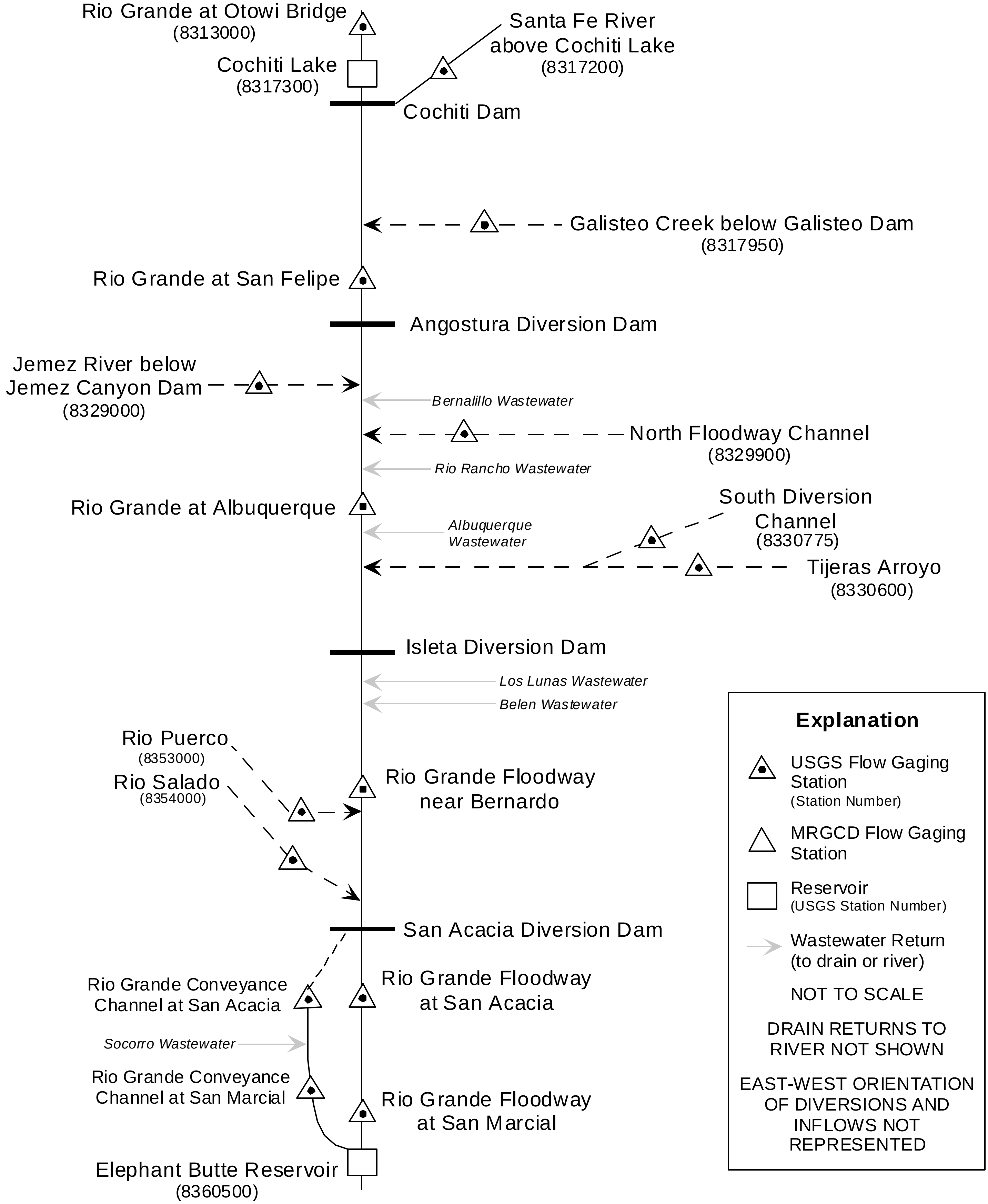
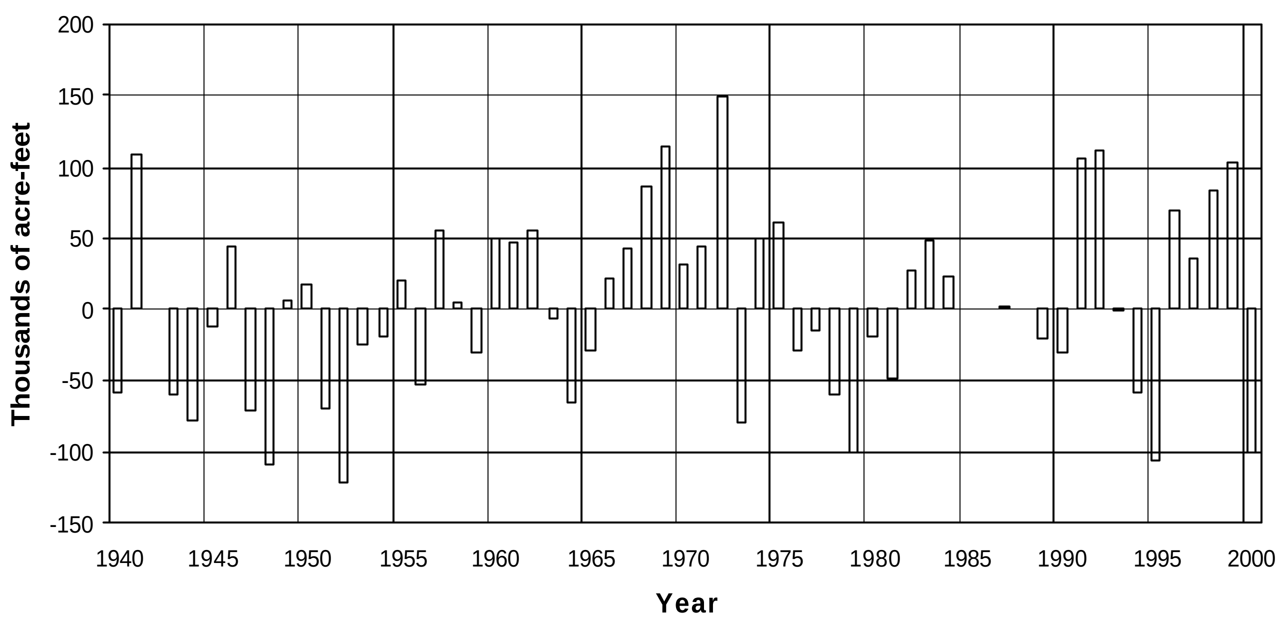


Figure 3.2 Net Supply (Otowi Index Supply minus Scheduled Delivery)
(Quantities in thousands of acre-feet)

Figure 3.3 Rio Grande Compact Credit History



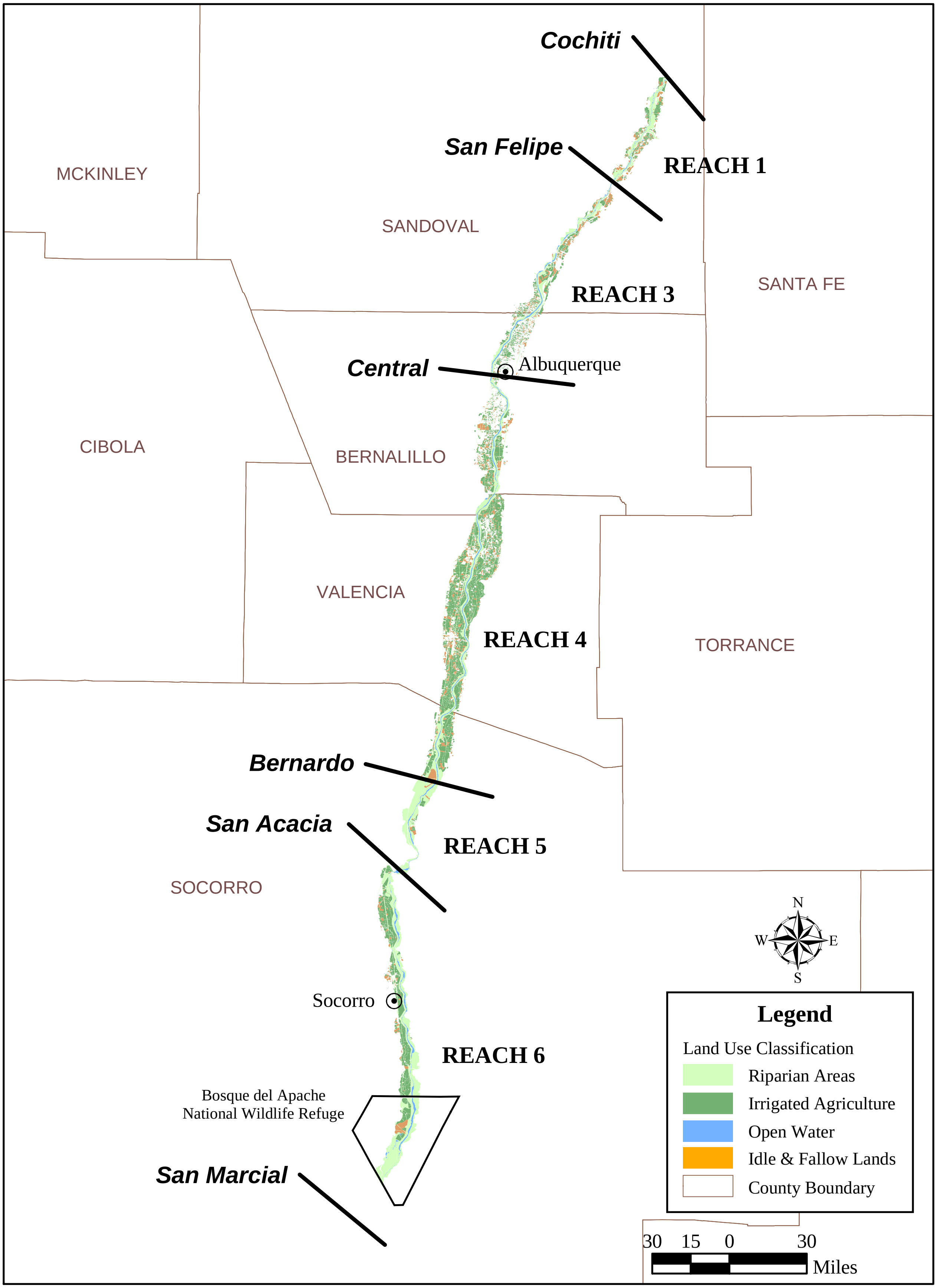


Figure 3.4. ET Toolbox reaches and 1992 LUTA/Extended agricultural, riparian, and open water acreages Cochiti to San Marcial

Table 3.1
Metadata Database: Summary of Included Data Sets

Time Series Data

USGS Gaging Stations, Flow:	Daily flow for each of 46 stations, including river, canals, drains and tributaries.
USGS Stations, Reservior Contents:	Daily contents, 2 stations, Cochiti Lake and Elephant Butte Reservoir
MRGCD Flow:	Daily flow at 13 stations, including canals, drains.
EPA records, wastewater:	Monthly NPDES discharge at Rio Rancho, Bernallilo, Albuquerque, Los Lunas, Belen, Socorro
Rio Grande Compact Data:	Rio Grande Compact Commission reported values for: Otowi Index Flow, Elephant Butte Scheduled Delivery, Elephant Butte Effective Supply, Trans-Mountain diversions, and Credit/Debit Balance
Crop Consumptive Use:	Daily crop use, for URGWOM reaches 1-5 from USBR ET Toolbox Daily crop use, for URGWIM reach 6 from USBR ET Toolbox
Riparian Consumptive Use	Daily riparian use, for URGWOM reaches 1-5, from USBR ET Toolbox Daily riparian use, for URGWOM reach 6, from USBR ET Toolbox
Cochiti Lake Evaporation	Daily evaporation, calculated by ACOE
Elephant Butte Evaporation	Daily evaporation, calculated by USBR
Groundwater Extraction	USGS groundwater model well file (as replicated in OSE model, well package)
Precipitation	Albuquerque WSFO Airport, New Mexico Historical Monthly Total Precipitation

Spatial Data

USGS Gaging Station Locations, for all active or discontinued gages on Rio Grande between Rio Grande at Otowi and Rio Grande below Elephant Butte; and, all active or discontinued gages for tributary flo ws at downstream location nearest to Rio Grande mainstem, point coverage

Land Use Area (from LUTA, USBR MRG Assessment), polygon and/or line coverages:

- Vegetation classification for MRGCD Cochiti, Albuquerque, Belen, Socorro divisons, and San Marcial sub-area
- Vegetation classification for Bernalillo County, Sandoval County, Valencia County, and Socorro County
- Hydrography coverages for MRGCD Cochiti, Albuquerque, Belen, Socorro divisons, and San Marcial sub-area. (MRGCD drains, canals, river and portions of tributary inflow channels)
- Hydrography coverages for Bernalillo County, Sandoval County, Valencia County, and Socorro County
- Transportation coverages for MRGCD Cochiti, Albuquerque, Belen, Socorro divisons, and San Marcial sub-area
- County boundaries for the State of New Mexico
- Boundary of USGS Middle Rio Grande study area
- Transportation line coverage for the State of New Mexico
- CDP polygon coverage for the State of New Mexico (cities)

Federal land ownership for lands in the Middle Rio Grande region, polygon coverage

Natural hydrography for the State of New Mexico, line and polygon coveages

Digital geologic map of State of New Mexico – river alluvium

Shaded relief map of the State of New Mexico

1:1,000,000 BLM PLSS map of New Mexico

Hydrologic Unit Codes (HUC) for the State of New Mexico (watersheds: unit code, perimeter, area)

MRGCD Property Boundary Coverage (tax assessment parcel data layer)

Digital Hydrologic Reach map of New Mexico

Table 3.2

Existing Gaging Stations for Monitoring Key MRGCD Irrigation System Flows

Gage Name	Gage ID	Operator	Gage Purpose	Period of Record
Cochiti Division				
Cochiti East Side Main Canal	CCCN5	USGS	Canal Heading	1954 - present
Sili Main Canal	SILN5	USGS	Canal Heading	1954 - present
Approximately 10 - 14 return flow points	--------	---------	Returns to River	TBD
Cochiti Main at San Felipe	CMCCN	MRGCD	mid-reach	(1954) 1974 - present
Albuquerque Division				
Albuquerque Main Canal	ALBCN	MRGCD	Canal Heading	1974 - present
Atrisco Feeder Canal	ATFCN	MRGCD	Canal Heading	1974 - present
Algodones Riverside Drain	ALGDR	MRGCD	Return from Cochiti Div.	1974 - present
Lower San Felipe Drain Outfall	SNFDR	MRGCD	Return from Cochiti Div.	TBD
Arenal Main Canal	ARECN	MRGCD	Central Ave. X-Section	1974 - present
Armijo Acequia	ARMCN	MRGCD	Central Ave. X-Section	1958 - present
Atrisco Ditch	ATDCN	MRGCD	Central Ave. X-Section	1958 - present
Albuquerque Riverside Drain @ Central Avenue	ALBDR	MRGCD	Central Ave. X-Section	1954 - present
Corrales Main Canal	CORCN	MRGCD	West side feeder Canal	1974 - present
Upper Corrales Riverside Drain	UCRDR	MRGCD	Drain to River	2001 - present
Corrales Main Canal Wasteway	CORWW	MRGCD	Wasteway to River	1997 - present
Central Avenue Wasteway	CENWW	MRGCD	Wasteway to River	2000 - present
Atrisco Riverside Drain	ATRDR	MRGCD	Drain to River	1997 - present
Lower Corrales Riverside Drain	LCRDR	MRGCD	Derived drain to River	2000 - present
Albuquerque Riverside Drain	ARSDR	MRGCD	Drain to River	1997 - present
Sandia Lakes Wasteway	SANWW	MRGCD	Wasteway to River	2000 - present
Pajarito Lateral	PAJCN	MRGCD	Secondary Canal	2002/03 - present
Gun Club Lateral	GUNCN	MRGCD	Secondary Canal	2002/03 - present
Butte Lateral	BUTCN	MRGCD	Secondary Canal	Anticipated 8/03
Indian Lateral	INDCN	MRGCD	Secondary Canal	Anticipated 8/03

[1] This gage also forms the basis for estimating return flow to the river from this drain.

[2] Diversions from the Low Flow Conveyance Channel gaged intermittently by USGS.

[3] MRGCD has a new gage here beginning 2001.

TBD - the installation date has not yet been established.

Table 3.2 continued

Existing Gaging Stations for Monitoring Key MRGCD Irrigation System Flows

Gage Name	Gage ID	Operator	Gage Purpose	Period of Record
Belen Division				
Belen Highline Canal	BELCN	MRGCD	Canal Heading	1974 - present
Peralta Main Canal	PERCN	MRGCD	Canal Heading	1974 - present
Chical Lateral	CHICN	MRGCD	Canal Heading	1974 - present
Chical Acequia	CHACN	MRGCD	Canal Heading	1974 - present
Cacique Acequia	CACCN	MRGCD	Canal Heading	1974 - present
Lower San Juan Riverside Drain	LSJDR	MRGCD	Bernardo X-Section[1]	1974 - 2003; 2003 - present
Isleta Drain Outfall	ISLDR	MRGCD	Drain to River	Anticipated 2/04
Peralta Main Wasteway	PERWW	MRGCD	Wasteway to River	1999 - present
Feeder #3 Wasteway	FD3WW	MRGCD	Wasteway to River	2000 - present
Belen Riverside Drain	BELDR	MRGCD	Drain to River	2000 - present
New Belen Acequia Wasteway	NBLWW	MRGCD	Wasteway to River	Anticipated 2/04
Lower Peralta Riverside Drain #1	LP1DR	MRGCD	Drain to River	2001 - present
Lower Peralta Riverside Drain #2	LP2DR	MRGCD	Drain to River	2003
Sabinal Riverside Drain	SABDR	MRGCD	Drain to River	2001 - present
Storey Wasteway	STYWW	MRGCD	Wasteway to River	2003
San Francisco Riverside Drain	SFRDR	MRGCD	Drain to River	2003
Unit 7 Drain	UN7DR	MRGCD	Return to Socorro Division	2001 - present
Socorro Division				
Socorro Main Canal	SOCCN	USGS/MRGCD[3]	Canal Heading	2001 - present
Socorro Wasteway	SOCWW	MRGCD	Wasteway to LFCC	Anticipated 2/04
Brown Arroyo Wasteway	BRNWW	MRGCD	Wasteway to Brn. Arroyo	Anticipated 2/04
Socorro Riverside Drain at Bosque del Apache	SOCDR	MRGCD	end of MRGCD reach	2003
Socorro Main Canal South at Bosque del Apache	SMSCN	MRGCD	end of MRGCD reach	2003
San Antonio Ditch at Bosque del Apache	SADCN	MRGCD	end of MRGCD reach	2002
Elmendorf Drain at Bosque del Apache	ELMDR	MRGCD	end-reach	2003

[1]This gage also forms the basis for estimating return flow to the river from this drain.

[2] Diversions from the Low Flow Conveyance Channel gaged intermittently by USGS.

[3] MRGCD has a new gage here beginning 2001.

TBD - the installation date has not yet been established.

Table 3.3
Summary of USGS River, Conveyance and Tributary Gaging Stations

STATION NAME (upstream tributary and distant arroyo stations excluded)	Station Code	Station Number	Latitude	Longitude	County	Gage Datum (ft above NGVD)	Approximate Period of Record
Rio Grande At Otowi Bridge, Nm	R	8313000	355229	1060830	Santa Fe	5488.48	1885-1905, 1909-present
Cochiti East Side Main Canal At Cochiti, N. Mex.	C	8313500	353702	1061926	Sandoval		1954-present
Sili Main Canal (At Head) At Cochiti, N. Mex.	C	8314000	353710	1061928	Sandoval		1954-present
Rio Grande At Cochiti, New Mexico	R-d	8314500	353756	1061908	Sandoval	5224.7	1924-1970
Santa Fe River Above Cochiti Lake	T	8317200	353249	1061341	Santa Fe	5505	1970-present
Rio Grande Below Cochiti Dam, N. Mex.	R	8317400	353704	1061926	Sandoval	5226.08	1970 - present
Galisteo Creek Below Galisteo Dam, Nm	T	8317950	352756	1061257	Santa Fe	5450	1970-present
Rio Grande At San Felipe, Nm	R	8319000	352639	1062623	Sandoval	5115.73	1925 - present
Jemez River Below Jemez Canyon Dam,Nm	T	8329000	352324	1063203	Sandoval	5095.6	1936-1938; 1943-present
Rio Grande Near Bernalillo, N. Mex.	R-d	8329500	351705	1063545	Sandoval	5030.57	1941-1969
N Floodway Channel Nr Alameda N M	T	8329900	351158	1063553	Bernalillo	5015	1968-present
Rio Grande Nr Alameda, Nm	R-d	8329928	351054	1063920	Bernalillo		1989-1995
Corrales Riverside Drain Nr Corrales, Nm	D	8329930	351219	1063830	Bernalillo	4995	1996-present
Corrales Main Canal Outfall At Albuquerque, Nm	O	8329931	350941	1064027	Bernalillo	4990	1996-present
Rio Grande At Albuquerque, Nm	R	8330000	350521	1064047	Bernalillo	4946.16	1941 - present
Rio Grande At Rio Bravo Bridge Near Albuquerque,Nm	R-d	8330150	350159	1064023	Bernalillo		1991-1995
Tijeras Arroyo Nr Albuquerque, N. Mex.	T	8330600	350004	1063918	Bernalillo	5000	1951-1968, 1974-present
South Div Channel Abv Tijeras Arroyo Nr Albq, Nm	T	8330775	350009	1063902	Bernalillo	4930	1988-present
Tijeras Arroyo Bl S Div Inlet Nr Albuquerque, Nm	T-d	8330800	350009	1063941	Bernalillo	4933	1974-1988
Rio Grande At Isleta, Nm	R-d	8331000	345421	1064104	Valencia		1925-1929, 1936-1938
Belen Highline Canal Trib Nr Los Lunas, Nm	O-d	8331100	344920	1064910	Valencia	5250	
Rio Grande Near Belen, N. Mex.	R-d	8331500	343910	1064410	Valencia	4797.32	1941-1957
Abo Arroyo Trib. Near Blue Springs, N. Mex.	T	8331660	342647	1062946	Socorro	5960	1996-present
Rio Grande Conveyance Channel Near Bernardo, Nm	D	8331990	342452	1064811	Socorro	4720	1936-1937, 1964-present
Rio Grande Nr Bernardo, N. M.	R-d	8332000	342500	1064800	Socorro	4722.55	1936-1939, 1941-1964
Rio Grande Floodway Near Bernardo, Nm	F	8332010	342501	1064800	Socorro	4722.55	1936-1937, 1943-present
Lower San Juan Riverside Drain	D-d	8332030			Socorro		1954-1975
Bernardo Interior Drain Nr Bernardo,N. M.	D	8332050	342456	1064915	Socorro	4710	1936-1937, 1943-present
Rio Puerco Near Bernardo,Nm	T	8353000	342433	1065109	Socorro	4722.34	1939-present
Rio Salado Near San Acacia,Nm	T-d	8354000	341750	1065359	Socorro	4765	1947-1984
Socorro Main Canal North At San Acacia, Nm	C	8354500	341517	1065343	Socorro	4660.16	1936-present
Rio Grande Conveyance Channel At San Acacia, Nm	LFCC	8354800	341454	1065404	Socorro	4652.5	1954-present
Rio Grande Floodway At San Acacia, Nm	F	8354900	341523	1065318	Socorro	4654.5	1964 - present*
Rio Grande At San Acacia N M	R-d	8355000	341513	1065345	Socorro	4658.1	1936-1964
Nogal Arroyo Fwy Nr Socorro, Nm	T-d	8355200	340547	1065250	Socorro	4620	1969-1977
Arroyo De La Matanza At Socorro N M	T-d	8355300	340151	1065404	Socorro	4760	1969-1977
Rio Grande At San Antonio N M	R-d	8355500	335510	1065100	Socorro	4541.73	1951-1957
Socorro Main C S Near San Antonio, N. Mex.	C-d	8356000	335328	1065154	Socorro	4526.41	1937-1938, 1948-1971
San Antonio Riverside Drain Nr San Antonio, N M	D-d	8356500	335324	1065104	Socorro	4524.33	1948-1971
Elmendorf Int Dr Nr San Antonio N M	D-d	8357000	335212	1065139	Socorro	4518.9	1936-1938, 1948-1971
San Antonio Riverside Drain Nr San Marcial, N M	D-d	8357500	334431	1065528	Socorro	4487.12	1948-1971
Rio Grande Conveyance Channel At San Marcial, Nm	LFCC	8358300	334107	1065940	Socorro	4454	1958-1959, 1964-present
Rio Grande Floodway At San Marcial, Nm	F	8358400	334050	1065930	Socorro	4455.19	1964-present
Rio Grande At San Marcial N M	R-d	8358500	334050	1065930	Socorro	4455.19	1895-1964
Milligan Gulch Nr San Marcial N M	T-d	8358550	333937	1070525	Socorro	4720	1968-1978
Rio Grande At Narrows In Elephant Butte Res N M	R-d	8359500	332310	1070945	Sierra	4363.63	1951-1957
Rio Grande Below Elephant Butte Dam, Nm	R	8361000	330854	1071222	Sierra	4242.09	1915 - present

CODES:

R River
C Canal
D Drain
T Tributary
O Outfall
LFCC Low Flow Conveyance Channel
F Floodway
d Discontinued station

Table 3.4

Agricultural Consumptive Use

Reach	URGWOM Reach Number	Irrigated Acreage	Potential CU (af/year)	ET rate (af/acre/year)
Cochiti to San Felipe	1	2,963	10,572	3.57
San Felipe to Central Ave	3	7,000	27,025	3.86
Central Ave to Bernardo	4	39,601	157,314	3.97
Bernardo to San Acacia	5	446	1,547	3.47
San Acacia to San Marcial	6	13,490	51,320	3.80
Total		**63,500**	**247,778**	

Acreage values were taken from the 1992 LUTA/Extended GIS coverages directly; fallow and idle acreage is omitted. ET rate is taken from the January 2003 ET Toolbox data and represents the 1975-2002 average crop consumptive use.

Table 3.5

Riparian Consumptive Use

Reach	URGWOM Reach Number	Riparian Acreage	Potential Riparian CU, (af/year)	Riparian ET rate (af/acre/ year)
Cochiti to San Felipe	1	4,361	15,650	3.59
San Felipe to Central Ave	3	5,590	20,286	3.63
Central Ave to Bernardo	4	18,800	68,304	3.63
Bernardo to San Acacia	5	8,214	29,621	3.61
San Acacia to San Marcial	6	20,563	82,252	4.00
San Marcial to Elephant Butte	7	7,635	30,540	4.00
Total		**65,163**	**246,653**	

Acerages are taken directly from the 1992 LUTA/Extended GIS data. Open water ET rate is taken from the ET Toolbox for all reaches. Riparian ET rate is taken from the ET Toolbox for reaches 1 through 5; 4 acre-feet per acre is used for reaches 6 and 7. ET rate is taken from the January 2003 ET Toolbox data and represents the 1975-2002 average.

Table 3.6

Open Water Consumptive Use

Reach	URGWOM Reach Number	Open Water Acreage	Potential Open Water CU (af/year)	Open Water ET rate (af/acre/ year)
Cochiti to San Felipe	1	571	3,200	5.60
San Felipe to Central Ave	3	1,687	9,454	5.60
Central Ave to Bernardo	4	3,354	18,541	5.53
Bernardo to San Acacia	5	873	4,891	5.60
San Acacia to San Marcial	6	2,576	14,509	5.63
San Marcial to Elephant Butte	7	2,371	13,354	5.63
Total		**11,432**	**63,948**	

4.0 PROBABILISTIC WATER SUPPLY ANALYSIS

4.1 Water Supply Analysis Approach

Probabilistic water supply analyses were conducted to characterize the magnitude and variability of the conjunctive use water supply, including groundwater and surface water, to the Middle Rio Grande region (Study Area). A water budget model was assembled to serve as a template for the probabilistic water supply analysis. This water budget model is referenced to the Rio Grande surface water system, but integrates groundwater by incorporating externally calculated groundwater impacts on the surface water system. Because the analysis is referenced to the Rio Grande, the limitations of the Rio Grande Compact on the basin conjunctive use supply are readily incorporated.

The water budget model consists of supply terms, the primary sources of inflow into the Study Area, and demand terms, or depletions. Given that the goal of the study is to quantify supply, rather than river operations, transient changes in storage are not included in the analysis. The impact of long-term depletion of groundwater storage and the impacts of groundwater pumping on the Rio Grande is included through terms derived using groundwater models and groundwater studies. The USGS Albuquerque Basin groundwater model (McAda and Barroll, 2002) is applied in the Albuquerque Basin. Groundwater evaluations in the Socorro Basin are based on a model under development by the NMISC (Shafike, 2003, personal communications).

In this study, as in Phase 2 of the Water Supply Study, supply and demand terms are represented probabilistically where historic data exhibit variability and support the characterization of variability. For these water budget terms, the historic variability is fit with a probability distribution. In some cases, the historic record does not support probabilistic treatment; in these cases, a static value is selected to represent the term. Using the resulting probabilistic or static characterization of water budget elements, the water budget model simulates the water supply using a Monte Carlo analysis. The Monte Carlo analysis involves repeated simulation of the water budget model drawing from the component distributions. In each simulation, combinations of water budget terms are selected in random fashion, while maintaining the specified probability distributions and correlations. This process yields probability distributions for simulated water budget outcomes, including total inflow, total depletions and Compact credit/debit. Each run of the water budget model developed for this project, using the Monte Carlo approach, is based on 10,000 simulations. These simulations are also sometimes termed *events* or *realizations*.

4.2 Modeled Reaches for Regional Water Planning

To better accommodate the assessment of the regional planning alternatives, the probabilistic water budget model previously developed under Phase 2 was adapted to provide inflow and outflow at the Valencia-Socorro county line, corresponding with the southern boundary of the Middle Rio Grande Planning Region (MRGPR) and the northern boundary of the Socorro-Sierra Planning Region (SSPR). With this adaptation, the model is divided into three sections:

- Section 1 – Cochiti to Valencia-Socorro county line
- Section 2 – Valencia-Socorro county line to San Acacia
- Section 3 – San Acacia to Elephant Butte Reservoir (north end of the reservoir at high water)

The quantification of agricultural, riparian and open water consumptive use employed six reaches as used in the ET Toolbox (Section 3.4.4)[1], also sometimes referenced as "URGWOM reaches". These reaches are shown in Figure 3.4 and are identified as:

- Reach 1, Cochiti to San Felipe
- Reach 3, San Felipe to Central
- Reach 4, Central to Bernardo
- Reach 5, Bernardo to San Acacia
- Reach 6, San Acacia to San Marcial
- Reach 7, San Marcial to Elephant Butte Reservoir

To convert these reaches into the 3 model sections, Reach 4 was subdivided into two parts, Central to Valencia-Socorro county line, and Valencia-Socorro county line to Bernardo. Reaches and sub-reaches were then grouped into the three model sections as follows:

- Section 1: Otowi to Valencia-Socorro County Line – Includes Reach 1, Reach 3, and northern part of Reach 4 (Central to Valencia-Socorro county line). Also includes the area upstream of Reach 1, Otowi to Cochiti.

[1] ET Toolbox Reach 2, Jemez Canyon, is omitted since it is out of the study boundaries.

- Section 2: Valencia-Socorro County Line to San Acacia – Southern part of Reach 4 (Valencia-Socorro county line to Bernardo) and Reach 5

- Section 3: San Acacia to Elephant Butte Dam – Reach 6 and Reach 7. Also includes the Elephant Butte pool area (and sometimes dry, exposed pool area) below Reach 7.

Use of these three sections in the analysis allows the agricultural, riparian and open water consumptive use to be considered for the region as a whole, for areas specific to planning regions, or broken at San Acacia, a boundary used in many other studies and therefore a useful intermediate point. Acreages and consumptive uses by model section are discussed further in Sections 4.4.3 and 4.4.4.

Water inflow and uses have been similarly subdivided to facilitate use of these model results by the regional planning entities. Additional nodes were added to the model to calculate inflow and outflow at the Valencia-Socorro county line. The water budget terms contained in the model sections above and below the Valencia-Socorro county line are identified in Table 4.1, where terms are grouped for model section 1 (above the county line) and for model sections 2 and 3 (below the county line).

The computed outflow/inflow at the Valencia-Socorro county line and combinations of water budget terms above and below this line are provided to assist the planning regions in identifying the physical supply pertaining to their regions. However, it is important to remember the county line does not equate to a "delivery" point under the Rio Grande Compact or under any other legal, quasi-legal, or administrative framework. The physical location of inflow does not imply "ownership" or constitute a "claim" to the inflow by a region. Water rights in New Mexico are acquired and governed by state statutes, and, in the Rio Grande Basin, depletion is limited by the Rio Grande Compact. The inflows and outflows within the sub-regions are provided to support understanding of the location and distribution of water potentially available to regions, as may be helpful to the regional planning process.

4.3 Probabilistic Characterization of Inflow Components

In preparation for the Phase 3 model update, all flow data, including wastewater return flows and reservoir evaporation data, were updated through 2002, and probability distributions were re-computed for each term. The evaluation of variability in the water budget terms and the selection of a probability distributuion to characterize this variability is discussed below. For some terms, distributions changed little, if any; from those used in Phase 2 of the WSS. For other terms, distributions changed significantly. Both Phase 2 and Phase 3 distributions are listed in Table 4.2.

4.3.1 Otowi Index Supply

The Otowi Index Supply represents the “native” flow at the Otowi gage, the portion of the flow not influenced by upstream storage conditions or trans-mountain diversions. This index is computed on a monthly basis by the Rio Grande Compact Commission and is reported annually in the Rio Grande Compact Commission Annual Report. The Commission computes the Otowi Index Supply by adjusting the gaged flow at Rio Grande at Otowi Bridge (08313000) to account for changes in upstream storage and to remove the fraction of gaged flow comprised of trans-mountain diversions. This procedure isolates the index from the impacts of water development, operations and management; thus, the index is considered representative of the “native” upstream supply to New Mexico on the mainstem of the Rio Grande. It is assumed that variability in this index represents variability in climatic conditions influencing the watershed yield.

The Otowi Index Supply was updated to the year 2002 (Figure 4.1). The resulting annual 1950-2002 data were fit using the BestFit software. The mean for this period is 931,945 acre-feet per year. The optimal distribution was a beta distribution, truncated at the maximum and minimum values seen in the 52 year input record, 254,800 and 2,171,126 acre-feet per year.

4.3.2 Trans-Mountain Diversions (San Juan-Chama Project water)

The magnitude of the trans-mountain diversions utilized in a given year is a function of the demand, the user’s readiness to use the extra supply, and, inversely, the climate-dependent “native” supply. For the purpose of characterizing the variability of the trans-mountain diversions under present development conditions, the 1977 to 2002 period was selected to remove the variability of user readiness in the first few years after San Juan-Chama Project water became available (Figure 4.2). During the 1977 to 2002 period, the mean annual reported San Juan-Chama flow passing the Otowi gage is 71,569 acre-feet per year. A negative correlation of 0.58 was calculated between the native flow at Otowi and the trans-mountain diversion water; in years of greater native supply, less trans-mountain water was released to downstream San Juan-Chama contract holders. The 1977 to 2002 period was fit with a lognormal statistical distribution for inclusion in the model, truncated to the minimum and maximum flows observed during this time period. The correlation between San Juan-Chama and Otowi Index supply flows is implemented in the probabilistic water budget model by specification of an independent-dependent variable pair.

4.3.3 Santa Fe River Inflow

The flow at the most downstream station on the Santa Fe River, USGS gaging station 08317200, is representative of the inflow of this perennial tributary to the Rio Grande (Figure 4.3). Since the completion of Cochiti Dam, the Santa Fe River joins the Rio Grande at Cochiti Lake, immediately upstream of the dam. Flow in the Santa Fe River is comprised largely of wastewater flow from municipal usage in Santa Fe, and has gradually increased over the period of record in response to increasing population in the Santa Fe area, although the flow also responds to precipitation and operational events. Updating this record through 2002 is not possible, as the gage was discontinued in 1999. Lacking sufficient record to characterize variability, and on the assumption that, to large extent, this flow is a function of wastewater discharge, a static value is used for Santa Fe River inflow in the probabilistic water supply model. To estimate present development conditions, annual flow in the 6-year period 1993 to 1998 was averaged, yielding a value of 9,580 acre-feet per year.

4.3.4 Galisteo Creek

Galisteo Creek conveys intermittent run-off to the Rio Grande. The confluence of Galisteo Creek and the Rio Grande is located in the reach between Cochiti Dam and the San Felipe gage. This flow is measured at USGS gaging station 08317950, with a period of record extending from 1970 to 2002 (Figure 4.4). Data for the period of record were fit with a Weibull probability distribution function, truncated at zero and 20,000 acre-feet per year, two times the maximum observed flow for the period of record.

4.3.5 Jemez River

The Jemez River flows into the Rio Grande downstream of the San Felipe Pueblo and upstream of Bernalillo. The flow of the Jemez River is gaged below Jemez Canyon Dam at USGS gaging station 08329000; the flow at this station represents the inflow to the Rio Grande from the Jemez River (Figure 4.5).

Jemez River flow data was updated from 1950 through 2002 and refit with a new probability distribution. The optimal distribution was a beta, truncated at the maximum and minimum values seen in the 52 year input record, 7,739 and 122,908 acre-feet per year. Additionally, there is a correlation of 0.85 between the Jemez River flows and the Otowi Index Supply. Both the Jemez River and the Rio Grande above Otowi watersheds are located in the northern part of the state and include significant components of snowmelt.

4.3.6 AMAFCA Inflow

The AMAFCA inflow consists of intermittent run-off from the Albuquerque metropolitan area, collected through a network of channels constructed in the urban area. This inflow is comprised of flow gaged at three locations: the North Floodway Channel (08329900), the South Diversion Channel (08330775) and the Tijeras Arroyo (08330600) (composite record, Figure 4.6). The period for which records were available at these three gaging stations is 1988 to 2002. The optimal probability distribution for this term was a gamma distribution. The distribution was truncated at zero and 40,000 acre-feet per year, two times the maximum observed flow for the period of record.

4.3.7 Rio Puerco

The Rio Puerco conveys intermittent flow to the Rio Grande downstream of Bernardo (Figure 4.7). The period of record used to characterize variability at this station was 1950 to 2002. The optimal probability distribution for this term was a lognormal function. The distribution was truncated at zero and 230,000 acre-feet per year, two times the maximum observed flow for the period of record. The flow of the Rio Puerco is not correlated with the Otowi Index Supply. Though a portion of the Rio Puerco drainage basin lies in the northern mountains, annual flow is strongly influenced by rainfall events in its more southerly drainage basin.

4.3.8 Rio Salado

The Rio Salado conveys intermittent flow to the Rio Grande below San Acacia (Figure 4.8). Flow derived from the USGS gaging station at Rio Salado (08354000) has a continuous annual record ranging from 1948 to 1984. As in the Phase 2 modeling, the correlation between the Rio Salado and the Rio Puerco was evaluated for the overlapping period of record, 1950 to 1984, and the following linear regression was derived (units of acre-feet per year):

Rio Salado Flow = (Rio Puerco Flow *0.303) + 1549

This regression was used to extend the period of record for the Rio Salado to 2002. The optimal probability distribution for the resulting time series was a lognormal. Flows were truncated at 0 and 160,000 acre-feet, two times the observed maximum flow.

The correlation between the Rio Salado and Rio Puerco flows for the 1950-1984 period is 0.56; the two rivers are in adjoining basins and share similar topography in their lower basins. This correlation was included in the model; the Rio Salado was modeled as dependent on the Rio Puerco, with a dependency of 0.56.

4.3.9 Ungaged tributaries; Westside and Eastside inflow

Inspection of the tributary gaging network and basin drainage characteristics in the Middle Rio Grande region suggest that significant ungaged tributary inflow likely occurs. On the west side of the Rio Grande, the ungaged tributary inflow includes the Rio Salado (formerly gaged) and inflow from tributaries to the south, including Tiffany Canyon, Milligan Gulch, Alamosa Creek and many smaller drainages that discharge directly to the Rio Grande or to Elephant Butte Reservoir. On the east side of the Rio Grande, ungaged tributary inflow includes Hell Canyon Wash, Canada Ancha, Abo Arroyo, Palo Doro Canyon and many smaller arroyos that drain to the Rio Grande.

Very little information is available concerning the magnitude of flows from these regions. No gaged records of any length exist for west-side arroyos below the Rio Salado, or for east-side arroyos below Albuquerque. To obtain an estimate of ungaged tributary inflow, drainage areas for the ungaged tributaries have been assessed and flow relationships assumed using relationships based on drainage or upland contribution areas for gaged tributaries. These values are considered placeholders and should be refined when better information becomes available.

Ungaged tributaries within Section 1 of the model are located on the east side of the Rio Grande within the Hell Canyon and the Manzano Mountains subareas as delineated by Anderholm (2001) in a study of mountain-front recharge. Although many arroyos in this area disappear as they traverse the boundary between upland areas and the basin (indicative of their contribution to mountain front recharge to groundwater), several larger arroyos continue to the Rio Grande. The drainage areas identified by Anderholm for these subareas correspond to the upland areas of the watershed adjacent to the basin margins, and are identified as 41,910 and 38,900 acres, respectively. Flow to the Rio Grande from these tributaries is estimated based on a relationship derived from the nearby Tijeras Arroyo. Though not entirely similar in topography or land use, absent other information, this method provides an approximation for use in this water budget. The upland drainage area for the Tijeras Arroyo is identified by Anderholm as 64,000 acres. The gaged flow at the Tijeras Arroyo near Albuquerque (08330600) averaged 330 acre-feet per year from 1982 to 1998. Using this information, tributary inflow of 420 acre-feet per year is estimated for the Hell Canyon and Manzano Mountain subareas into Section 1 of the water budget model. This value is input as a constant.

Ungaged tributaries entering the Rio Grande from the east in Section 2 of the model (county line to San Acacia) include the Abo Arroyo and arroyos of the Los Pinos Mountains subarea, as delineated by Anderholm (2001). These upland watershed for these subareas are 158,730 and 44,940 acres, respectively. A temporary gaging station on the Abo Arroyo near the mountain front indicated total streamflow of about 12,400 acre-feet per year for water year 1997. Anderholm indicates that most of the flow at the gaging station was runoff from intense summer thunderstorms, and that this value is estimated to be approximately 150% of the average, based on precipitation records for that year. Anderholm estimated, based on the frequency and magnitude of flows, that the annual infiltration of summer thunderstorm runoff is only about 900 acre-feet. Based on this estimate, he concluded that much of the streamflow measured at the mountain front discharges to the Rio Grande. Allowing for more typical precipitation conditions and for incidental losses due to evaporation and evapotranspiration, a placeholder value of 5,000 acre-feet per year is used for tributary inflow from the Abo Arroyo. The Los Pinos Mountains sub-area is drained by Palo Duro Canyon and is flanked by a number of smaller drainages. Absent further information, this sub-area is assumed to yield on average about 1,400 acre-feet per year to the Rio Grande. Together, the Abo and Los Pinos subareas are assumed to contribute an average of 6,400 acre-feet per year to the river system.

Numerous ungaged tributaries are present on both the west and east side of the Rio Grande in Section 3 of the Study Area (San Acacia to Elephant Butte). For these areas, runoff occurs via a large number of nearly parallel channels traversing the basin. Absent better information, the ungaged inflow from these areas is estimated using a direct relationship between the entire watershed area and gaged flows for the Rio Salado. The Rio Salado drainage is 883,197 acres, as reported by the USGS. The drainage areas of the Section 3 Westside and Eastside ungaged regions were evaluated based on a regional GIS coverage, and found to be 1,453,465 acres and 389,390 acres respectively (Figure 4.9).

The Rio Salado lognormal distribution was applied to the ungaged regions in Section 2 and Section 3, with multipliers derived from the information presented above. Similar to the method used to model the Rio Salado, the flows from the ungaged watersheds in Section 3 were modeled as dependent on the Rio Puerco. The Westside region was assigned a dependency of 0.4 and the Eastside region was assigned a dependency of 0.3. Dependencies were chosen to reflect increasing distance or characteristics from the Rio Puerco basin.

4.3.10 Base "Adjusted" Groundwater Inflow

Base "adjusted" groundwater inflow represents the net groundwater that would flow into or from the river under the present river-conveyance infrastructure conditions without pumping of groundwater, deep percolation of applied irrigation water, and riparian evapotranspiration. While not strictly physically-based, the base "adjusted" groundwater inflow is important as a baseline term to the water budget model. The base "adjusted" groundwater inflow term is included in the probabilistic model as a term representing the combination of stream-aquifer exchanges that would occur under steady-state conditions absent influences of pumping, irrigation and riparian use. This term can be conceptualized as representing the combination of mountain front recharge, basin inflow and recharge through tributary streams, absent natural incidental depletions in upland areas. The effect of pumping, irrigation and riparian use on the stream are calculated and tracked separately in the probabilistic water supply model.

Stream-aquifer interactions between Cochiti Dam and San Acacia were incorporated through external calculations made using the recently released USGS Albuquerque Basin groundwater flow model (McAda and Barroll, 2002). Net groundwater-stream exchanges calculated by the model for non-pumping conditions were adjusted to exclude irrigation percolation and riparian groundwater use, to reflect the adjusted baseline condition defined above. Details on the modeling analysis and adjustment procedure for calculating the baseline inflow are provided in Appendix E. This groundwater inflow component is handled as a static value in the probabilistic water budget model, under the assumption that year-to-year climatic-based variability is not significant for this term. Based on this analysis, the base adjusted groundwater inflow to the rivers and drains between Cochiti Dam and San Acacia was modeled as 49,940 acre-feet per year. This value is approximately 41,000 acre-feet per year less than was estimated with the groundwater model (Barroll, 1999) used in Phase 2, and largely reflects a reduction in estimated recharge to the Middle Rio Grande Basin supported by USGS studies cited by McAda and Barroll (2002).

For the region below San Acacia, the base adjusted groundwater inflow (defined under conditions of no pumping, no irrigation return flow, and no evapotranspiration) is approximated as equaling total groundwater recharge. For the Socorro and San Marcial basins, groundwater recharge is estimated as 16,500 acre-feet per year (Roybal, 1981). As for the reach above San Acacia, this inflow component is handled as a static value in the probabilistic water budget model.

4.3.11 Wastewater Return Flows

Monthly wastewater discharge records, under Environmental Protection Agency (EPA) NPDES permits, for the municipalities of Albuquerque, Belen, Bernalillo, Los Lunas, Rio Rancho and Socorro, were obtained as electronic files from the EPA for the years 1989 to 2002. Since 1998, wastewater return flow trends in the Middle Valley appear to have shifted, and reflect a declining trend (Figure 4.10). This trend is driven by the Albuquerque wastewater data and is assumed to result from water conservation efforts within the City of Albuquerque. The average return flow over the period from 1997 to 2002, or, 66,634 acre-feet per year, is assumed for the water budget model.

4.3.12 Effective Precipitation

Agricultural and riparian consumptive use is partially satisfied by effective precipitation, the portion of precipitation that does not run off or infiltrate and is therefore available for use by plants. In the water budget, potential consumptive use is partially offset by an assumed value for effective precipitation.

The effective precipitation is assumed to equal 4 inches per crop or riparian acre. This value is approximately 50% of the annual precipitation. This value is used as a placeholder; no rigorous studies were found on this topic applicable to the basin-wide scale of this study. Multiplying the assumed rate of effective precipitation by the crop, riparian and open water acreage (Section 4.4.3 and 4.4.4), the total effective precipitation for the water budget is calculated as:

- Cochiti to County Line: 24,648 acre-feet per year
  (44,291+24,565+5,088)acres *.3333 feet per year = 24,648 acre-feet per year

- County Line to Elephant Butte: 22,050 acre-feet per year
  (19,209+40,598+6,344)acres *.3333 feet per year = 22,050 acre-feet per year

4.4 Characterization of Depletions

4.4.1 Cochiti Reservoir Evaporation

Evaporation from Cochiti Lake occurs in response to reservoir surface area and climatic conditions. In general, water levels in Cochiti Reservoir are maintained at or near the recreation pool surface area of 1,200 acres, resulting in a relatively constant annual evaporative loss, with the exception of 1985, 1986 and 1987 when reservoir storage and evaporation were significantly higher. All three of these years were spill years. Accordingly, a probability distribution for Cochiti evaporation was derived from the 1976 to 2002 period of record, omitting 1985, 1986 and 1987. A normal distribution with an average of 6,708 acre-feet per year was developed from the remaining 24 years of data. This distribution is representative of Cochiti losses in all but spill years; during spill years Compact credit/debit status is zeroed, and increased evaporative losses from Cochiti become less significant.

4.4.2 Surface Water Depletions due to Groundwater Pumping

Surface water depletions due to groundwater pumping between Cochiti Dam and San Acacia were calculated using the recently released USGS groundwater model of the Albuquerque Basin (McAda and Barroll, 2002). A simulation of historical pumping was conducted through year 2000, with total pumping (estimated for the City of Albuquerque and other users in the Albuquerque Basin as part of the USGS modeling study) at the end of the simulation at 150,474 acre-feet per year. The model results indicate that depletions to surface water, including the river, drains and reservoirs, resulting from this pumping is 79,600 acre-feet per year for the "present condition" (i.e., given land use and development conditions occurring in the year 2000). This assessment is further described in Appendix F. This simulated impact differs somewhat from that of the Phase 2 study, reflecting changes in pumping rates, aquifer transmissivity and other parameters in the 2002 USGS model. Given the location of the wells within the Albuquerque Basin, these impacts are assigned to the *Cochiti to Valencia-Socorro county line* area (Section 1) of the probabilistic water budget model.

Groundwater depletions north of the area covered in the Albuquerque Basin model, between Otowi and Cochiti, are primarily a result of pumping by the City of Santa Fe. Santa Fe depletions, resulting from pumping at the Buckman Well Field, were assessed by the NMOSE in 2003 at a value of 2,587 acre-feet per year (Peggy Barroll, personal communication).

Groundwater depletions south of the area covered in the Albuquerque Basin model occur between San Acacia and Elephant Butte. A groundwater model for this area is currently under development by the NMISC (Shafike, personal communication). The current version of the NMISC model has been used to simulate the impact of the City of Socorro's municipal pumping on the stream system (drains and river). This simulation indicated that the lag time between pumping and the occurrence of stream impacts is relatively short, as is expected given the relative proximity of the wells to the river, and given the transmissivity of the aquifer. Therefore, impacts of pumping on the stream system are set as equal to groundwater withdrawal rates. The City of Socorro withdrawals are set at 3,300 acre-feet per year for present development conditions, based on data provided by the City of Socorro to the NMISC. The depletions are incorporated into the water budget model as a static value for a given point in time. A probability distribution function was not developed for groundwater depletions since climatic-induced variability in this term tends to be dampened by the aquifer over the time frame of stream impacts.

4.4.3 Agricultural Consumptive Use

Agricultural consumptive use is estimated for both irrigated lands within the MRGCD as well as other irrigated areas, for example the La Joya Acequia, that reside outside of the boundaries of the MRGCD. Calculated agricultural acreages, average potential evapotranspiration rates, and average potential consumptive use, by reach, are given in Table 3.3. The potential agricultural consumptive use obtained from the Penman method (ET Toolbox, 2003) is adjusted to obtain an estimate for actual consumptive use due to factors such as plant health and sub-optimal irrigation. This adjustment was implemented by multiplying the potential consumptive use by a factor of 0.75. The value of 0.75 was developed by comparison of ideal to actual crop yield for alfalfa in the MRGCD. Measured crop yields in the MRGCD in the latter half of the 1990s averaged about 5 tons per acre (MRGCD Crop Census Reports, 1956-1966, 1981-1999). In the Socorro District, maximum yields are on the order of 5-6 tons per acre for poor soils and 7-8 tons per acre for good soils (Darrel Reasner, NRCS, personal communication). Accordingly, a value of 7 tons per acre is used as a reasonable maximum yield for alfalfa within the Middle Valley, and alfalfa is used as the baseline crop by which to adjust consumptive use for all crops. The adjustment of 0.75 is derived from the ratio of the average measured yield of 5.1 tons per to the maximum yield of 7 tons per acre. The base ET rate, acreage, and consumptive use values, by model section, used in the probabilistic water budget model are given in Table 4.3.

The annual potential evapotranspiration rates (Appendix C), adjusted as described above, were used to fit a probability distribution to the agricultural consumptive use. The adjusted annual ET rates were multiplied by acreages from the 1992 LUTA/Extended GIS (Table 4.3), and the resulting data were fit with a normal distribution with an average of 185,848 acre-feet per year and a standard deviation of 9,101 acre-feet per year. This variability (shown in Figure 4.12) is minimal, and only reflects climate factors utilized in the ET Toolbox Penman calculation. Other variables, i.e., cropped acreage, crop type and crop vigor, were not captured in this exercise. These latter variables are likely to be significant, perhaps resulting in changes up to 20% of the average. However, inspection of agricultural records has not yielded sufficient information to identify or to characterize trends in these factors, or their relationship to overall supply conditions. Improved understanding of the variability in agricultural consumptive use would be worth pursuing in future studies.

Correlations between annual agricultural consumptive use and Otowi Index and Rio Puerco flows were calculated and a significant negative correlation was found with the Rio Puerco (r = -0.428); during times of higher Rio Puerco flows, agricultural consumptive use tends to be smaller, presumably because both respond to summer monsoon. This correlation was incorporated into the probabilistic water budget model.

4.4.4 Riparian and Open Water Consumptive Use

For riparian vegetation and open water, actual consumptive use is assumed to be equal to the calculated potential consumptive use. Therefore, no adjustment is made to scale down the calculated potential consumptive use as was implemented for crops. For riparian consumptive use, this assumption is based on the fact that riparian plants are typically able to deepen roots to obtain water in dryer periods, and therefore are less susceptible to supply and distribution conditions than are crops.

Correlations between annual riparian and open water consumptive use and Rio Puerco flows were significantly smaller than those found for agricultural consumptive use. In response to the low consumptive use correlations with measured flow, coupled with the relatively small annual variability in the annual consumptive use for either open water or riparian (shown in Figures 4.13 and 4.14) riparian and open water consumptive use were input as constants. The 1975-2002 average ET rate, acreage and consumptive use values, by model section are given in Tables 4.4 and 4.5.

4.4.5 Elephant Butte Reservoir Losses

Elephant Butte Reservoir (EB) evaporative losses include open water evaporation from the lake surface area and additional losses from exposed, drained reservoir areas. The exposed areas may include wet soil areas, marshy areas and areas re-colonized with riparian vegetation. The EB losses have been calculated to include losses from the lake and the exposed area.

The open water evaporative loss from the lake is calculated by, and has been obtained from, the USBR. Other relevant data, including average annual reservoir content and average reservoir elevation, have been obtained for the years 1950 to 2002 to support an analysis of the corresponding exposed area for less-than-full reservoir conditions. Using a digital elevation model (DEM) of the reservoir constructed from USGS 10-meter DEM quadrangles, total and northern basin reservoir surface areas were calculated as a function of reservoir content. Based on these acreage/content relationships, estimates of potential evaporative loss from northern basin exposed land as a function of reservoir content were made. 90% of exposed northern basin lands were assumed to experience evaporative losses; this value was based on vegetative coverage observed on July 23, 2003 on an airboat tour of the narrows, the lower portion of the north basin, and the upper portion of the south basin, and as shown on satellite images of the reservoir taken between October 1999 and February 2003. A consumptive use of 4 acre-feet per acre, used to represent the willow and salt cedar communities currently present in the north basin, was applied to this additional acreage. The additional exposed area losses were added to the calculated reservoir evaporative losses to produce a total loss for the reservoir (Figure 4.15).

For inclusion in the model, total Elephant Butte Reservoir losses were fit with a 9-class histogram and the histogram used as the input distribution for the model. The correlation between total Elephant Butte Reservoir losses and Otowi inflow is r = 0.46; this correlation was included in the model by specifying a dependency of 0.46 on the Otowi Index Supply.[2] Losses were truncated at the minimum and maximum values of the total evaporation, 79,370 and 265,949 acre-feet per year, respectively.

[2] The correlation between this year's evaporative loss and last years Otowi Index Supply is slightly stronger, r=0.59, than the correlation between this year's Otowi Index Supply and this year's evaporative loss. However, because of how evaporative loss terms are selected, omitting this correlation has only a small impact on the resultant credit-debit for any given year, and virtually no impact on the overall probability distributions calculated as part of the model output.

4.5 Probabilistic Description of the Water Supply and Rio Grande Compact Credits/Debits Under Base Case Assumptions

Using the probabilistic and other characterizations described above, a risk analysis model representing the water budget was constructed for the Study Area. This model was implemented using the software @Risk, a spreadsheet-based model, with probability functions, correlations and other specified relationships used in place of fixed values (Appendix D). The model was operated using Monte Carlo procedures, which involved sampling and running the model 10,000 times, with sampling implemented in accordance with the specified probabilistic or other relationships (Appendix F). This section describes the application of this model to a Base Case, representing present development conditions. Section 5 will describe the application of this model to analysis of alternatives selected by the planning regions.

4.5.1 Base Case Assumptions

The Base Case Model is based on three primary assumptions that affect interpretation of the results. First, the model is based on the 1950-2002 period of record, and therefore models the water budget under the range of climate conditions as they occurred in the period 1950-2002. How these conditions represent past climate in the region is discussed in Section 2.6, and in supporting work products developed as part of the Water Supply Study work and included in Appendix I. Second, the model assumes "present day" development conditions, generally derived from data for the year 2000. For example, the magnitude of groundwater pumping and other water uses are based on present conditions. Third, the model provides a snapshot of how Year 2000 conditions are manifested "at present". In other words, the Year 2000 Base Case model results do not reflect future lagged impacts of today's pumping. Future lagged impacts would be the subject of a modified scenario and will be discussed later in this report.

The model does not project what will happen in any given year; rather, the model results describe the variation in water supply and in Compact credit/debit conditions that should be expected given present day development in the context of climate variability. Finally, changes in development or water use conditions are modeled as "alternatives". The analysis of alternatives are reflected as changes from the Base Case described herein, and will be discussed further in Section 5.

4.5.2 Basin-Wide Probabilistic Description of Water Supply and Compact Credit/Debit

The probabilistic water supply model for the present condition was applied using the probabilistic description of water budget terms described above. The model results include probability distribution functions of the total inflow, total depletions, tributary inflow, Elephant Butte Reservoir losses, and the Compact-based credit or debit, assuming the Compact schedule of deliveries. Figures 4.16 through 4.24 illustrate the probability distributions resulting from the Base Case model run. The figures illustrate the magnitude of flows at various percentiles within the probability distribution, ranging from the 5th to the 95th percentiles. The 50th percentile indicates the mean flow. The 25th percentile illustrates at what value a flow would be exceeded 75% of the time. The 75th percentile illustrates at what value a flow would be exceeded 25% of the time. These figures can be used to identify what flow should be expected to occur, and can be used to assist regional planners in assessing the variability in supply conditions. Maximum and minimum values, along with mean, standard deviation, and percentile values, are given in Table 4.6.

Figure 4.16 shows modeled basin-wide total inflow, including mainstem and tributary inflow, and the remainder of this inflow available for depletion within the region once the Compact obligation is satisfied. Annual inflow to the region varies from less than 700,000 acre-feet per year to over 2,200,000 acre-feet per year, with an average of about 1,300,000 acre-feet per year. However, of this, only 475,000 to 890,000 acre-feet a year are available for use. The primary contributions to this inflow are from, in order of magnitude, the Otowi Index Supply (Figure 4.17), the San Juan-Chama inflow (Figure 4.18), Jemez River (Figure 4.19), the Rio Puerco, and the Rio Salado (Figure 4.20). Several of the smaller tributaries are also shown in Figures 4.19 and 4.20.

Figure 4.21 illustrates total regional depletions. Total depletions range from 670,000 to 850,000 acre-feet a year. Most of this variation is due to Elephant Butte losses. The variability in Elephant Butte losses can be seen in Figure 4.22; losses for the reservoir range from less than 86,000 acre-feet per year, when reservoir levels are low, to over 260,000 acre-feet per year when the reservoir is at full capacity. Given that available inflow ranges from 475,000 to 890,000 acre-feet per year, this means that

Elephant Butte losses can account for anywhere from 10% to 55% of the regional depletions in a given year. In contrast, modeled agricultural, riparian and open water consumptive use is relatively constant, ranging only from 481,000 to 512,000 acre-feet per year (Figure 4.23).

The average Compact credit/debit resulting from these inputs is a 64,000 acre-feet per year debit. The modeled Compact credit/debit, based on the input distributions described above, for year 2000 conditions, is shown in Figure 4.24. As can be seen, given the Base Case model assumptions, debit conditions occur below the 80th percentile, i.e., Compact deliveries are made or exceeded only 20 years out of every 100, and debits in excess of 100,000 acre-feet per year occur at the 35th percentile and below. This suggests that, absent active involvement in water management, the Middle Rio Grande Basin will be at significant risk of Compact violation.

Figure 4.25 provides a schematic of the mean available water supply in the Middle Rio Grande region. The mean values represented on this figure are the mean outcome from 10,000 realizations of the probabilistic water budget model, using the Monte Carlo analysis. The mean available supply represents supply to the basin, excluding the mean Elephant Butte Scheduled Delivery (Rio Grande Compact Obligation). Initiating the figure, the available portion of the Otowi Index Supply is shown as 306,000 acre-feet per year. This number is the difference between 930,000, the mean Otowi Index Supply from the probabilistic model simulations, and 624,000, the mean Compact Obligation obtained from the probabilistic model simulations. It should be noted that this value is not equal to the value that would be obtained directly from the Rio Grande Compact schedule corresponding to the mean Otowi Index Supply of 930,000 acre-feet per year (568,000 acre-feet per year). Because the Compact schedule is not linear, the mean value for the delivery Obligation cannot be derived from the Compact schedule using the mean value of the Otowi Index Supply. Assessment of Rio Grande Compact compliance using average terms will lead to erroneously favorable conclusions, unless the non-linearity of the Compact schedule is incorporated.

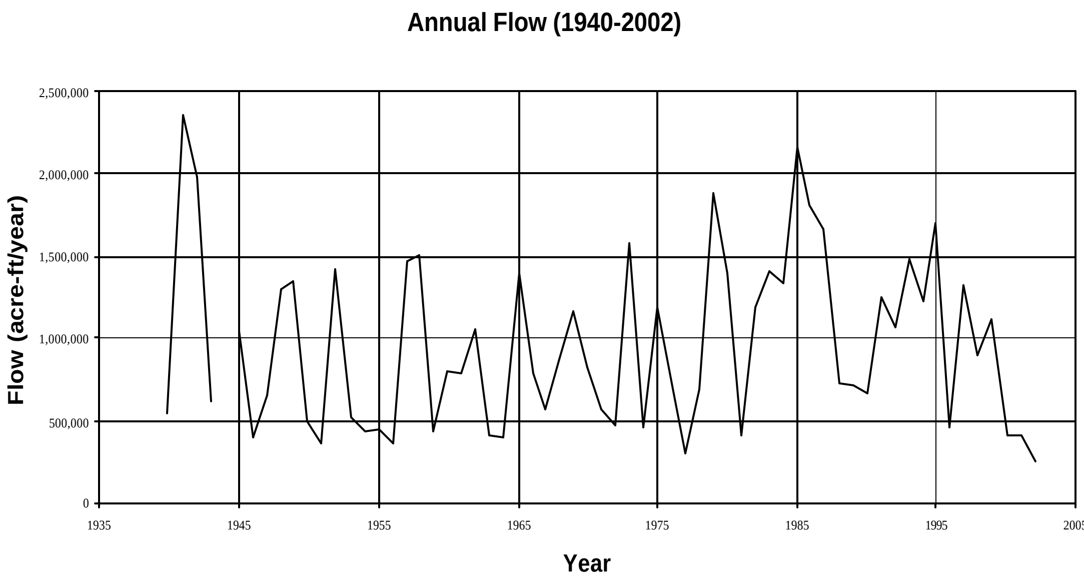
Figures 4.26 and 4.27 complete the picture with respect to the current disposition of the available supply. The pie graphs shown in these figures indicate the mean percentage of overall depletions occurring in various water use categories, according to the assumptions described in this and preceding sections. These graphs are based on the mean values of the model simulations. The percentages in the water use categories will vary to some degree, depending on climatic and water supply conditions in a given year. In particular, the reservoir evaporation is subject to a high degree of variation. The water use shown in Figures 4.26 and 4.27 does not include the full aquifer pumping currently ongoing in the basin; only stream depletions resulting from pumping are included. This means that about 70,000 acre-feet per year of aquifer storage depletions are not included in these figures.

4.5.3 Discussion

(Not yet available)

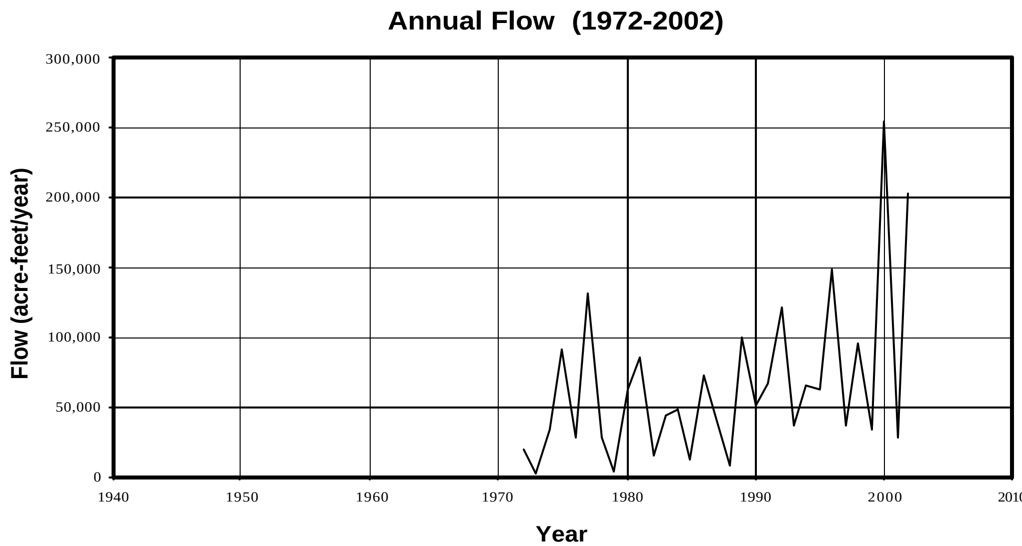
Figure 4.1

Otowi Index Supply



Title: Otowi Index Supply
Period of Record: 1940 - present
Data Source: Rio Grande Compact Commission
Comments: The Otowi Index Supply is computed on a monthly basis by the Rio Grande Compact Commission. The "native" flow at the Otowi Bridge gage is calculated by adjusting the gaged flow to add/subtract changes in upstream storage and to subtract the fraction of gaged flow comprised of trans-mountain diversions.

Figure 4.2
Trans-Mountain Diversions



Title: Trans-Mountain Diversions (San Juan-Chama)
Period of Record: 1972 - present
Data Source: Rio Grande Compact Commission

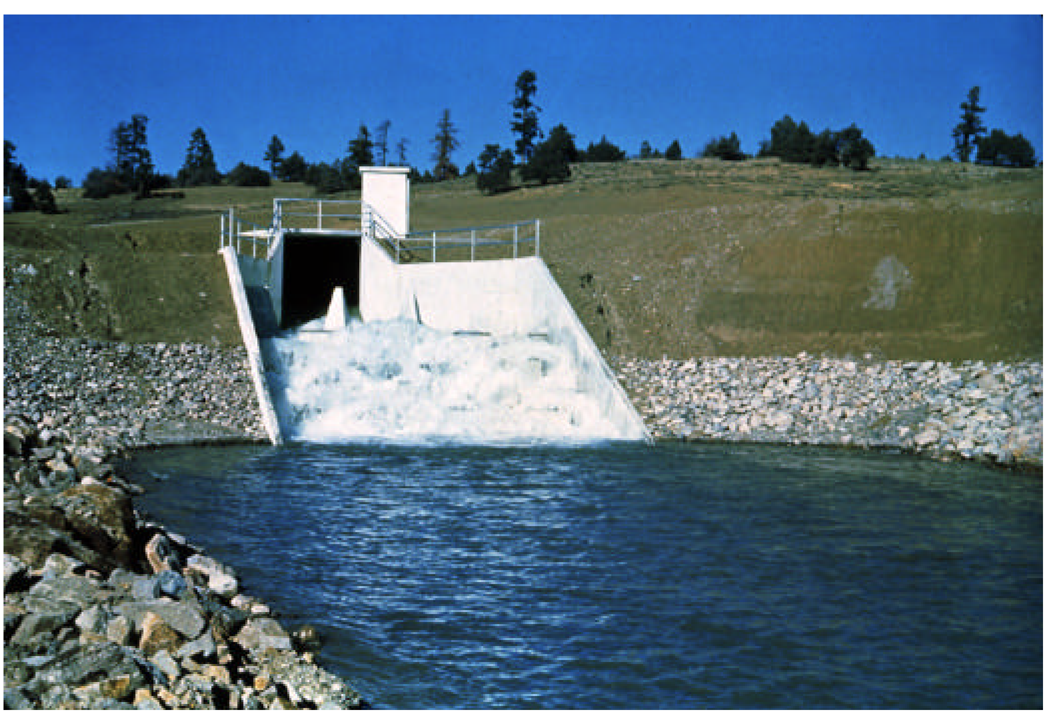
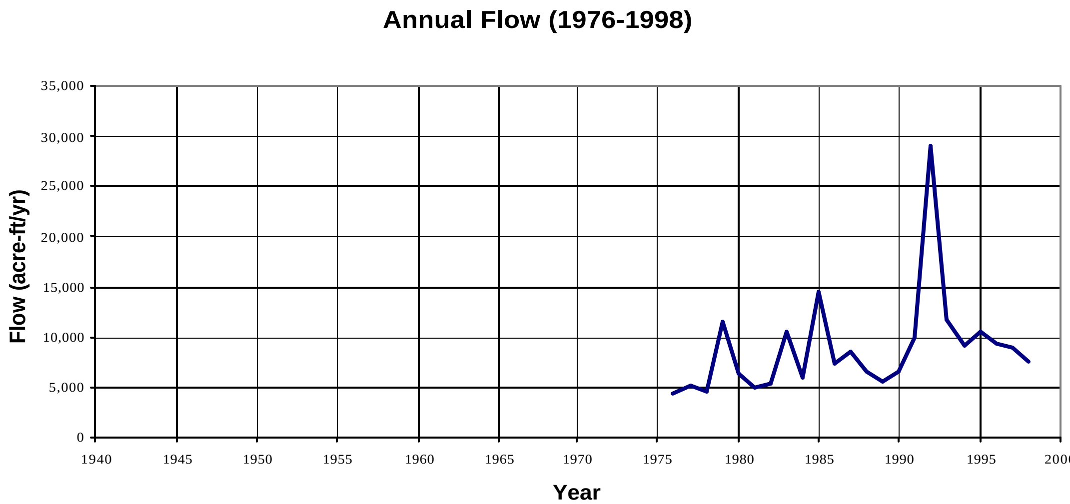


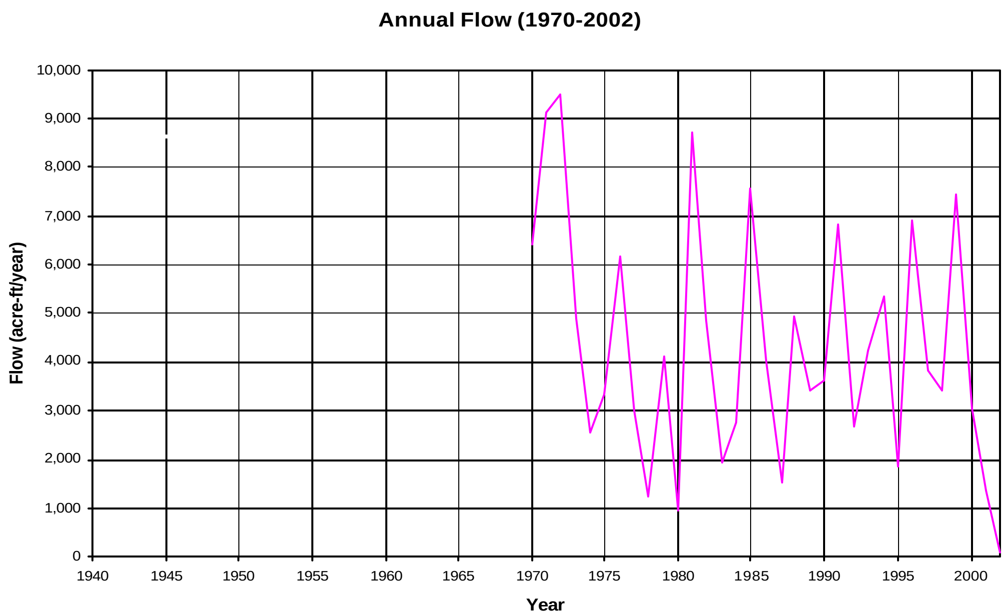
Figure 4.3

Santa Fe River



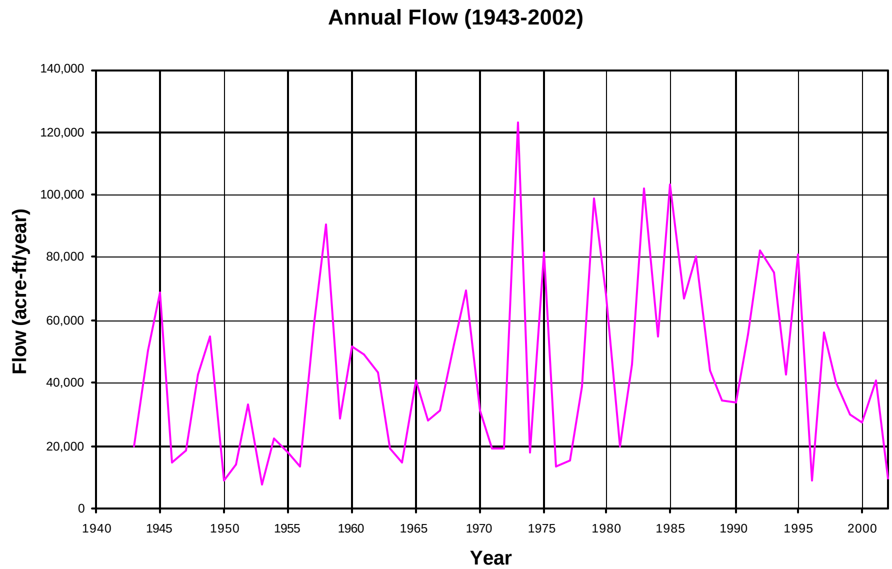
Station Name: Santa Fe River above Cochiti Lake
Station Number: 08317200
Latitude: 353249 N
Longitude: 1061341 W
Elevation : 5505 feet above NGVD
Period of Record: 1976 - 1998
Data Source: USGS

Figure 4.4
Galisteo Creek



Station Name: Galisteo Creek below Galisteo Dam
Station Number: 08317950
Latitude: 352756 N
Longitude: 1061257 W
Elevation : 5450 feet above NGVD
Period of Record: 1970 - present
Data Source: USGS

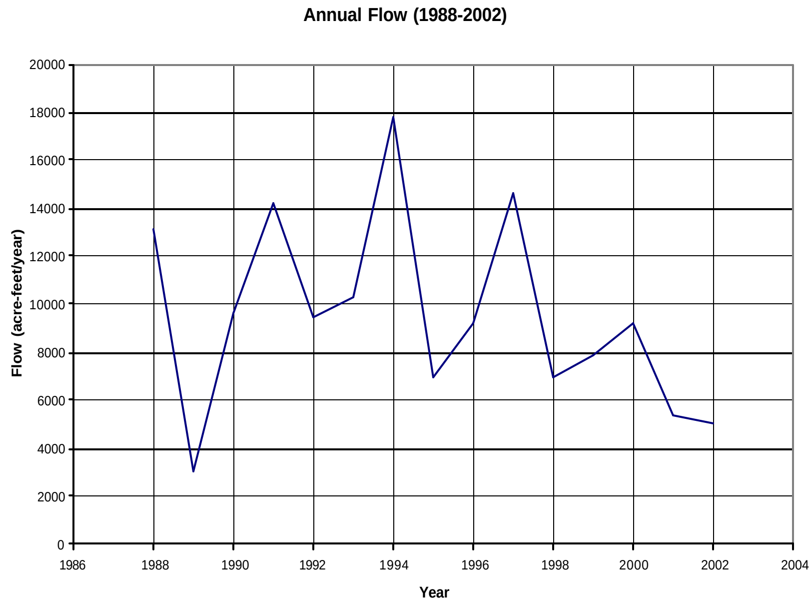
Figure 4.5
Jemez River



Station name: Jemez River below Jemez Canyon Dam
Station Number: 08329000
Latitude: 352324 N
Longitude: 1063203 W
Elevation: 5095.6 feet above NGVD
Period of Record: 1943 - present
Data Source: USGS

Figure 4.6

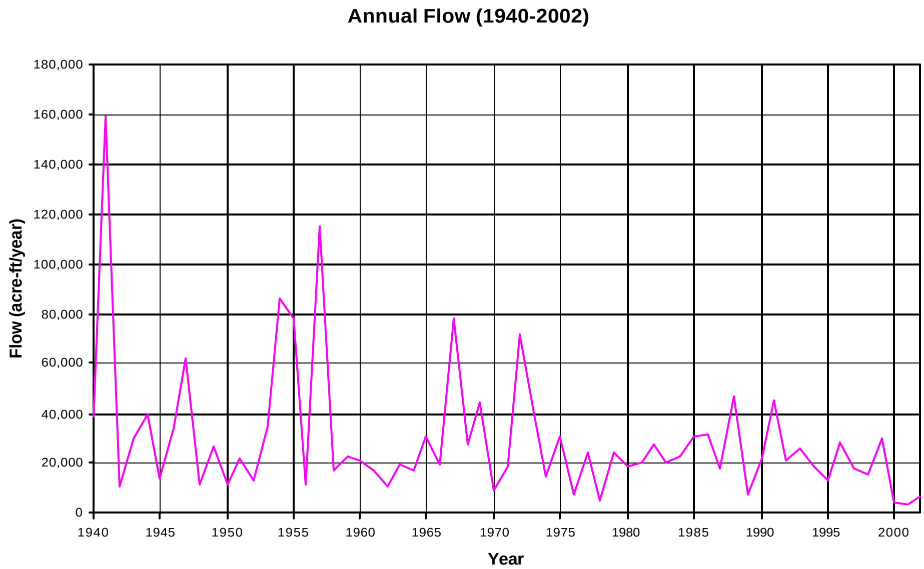
AMAFCA Inflow



Composite Flow: Albuquerque Metropolitan Arroyo Flood Control Authority channels to Rio Grande
Contributing Stations: 8329900, 8330775, and 8330600
Latitude: 351158 N, 350009 N, and 350004 N
Longitude: 1063553 W, 1063902 N, and 1063918 W
Elevation : 5015, 4930, and 5000 feet above NGVD
Composite Period of Record: 1988 - present
Data Source for Individual Stations: USGS

Figure 4.7

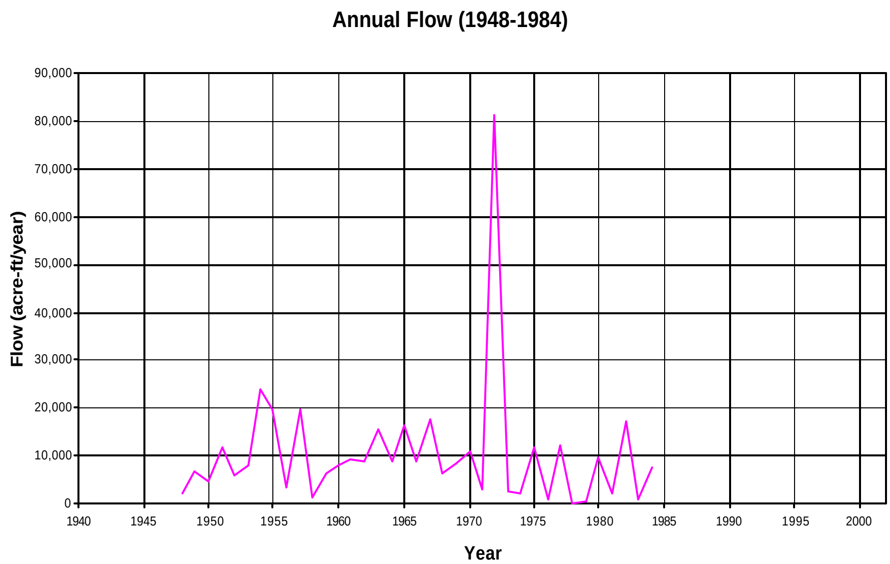
Rio Puerco



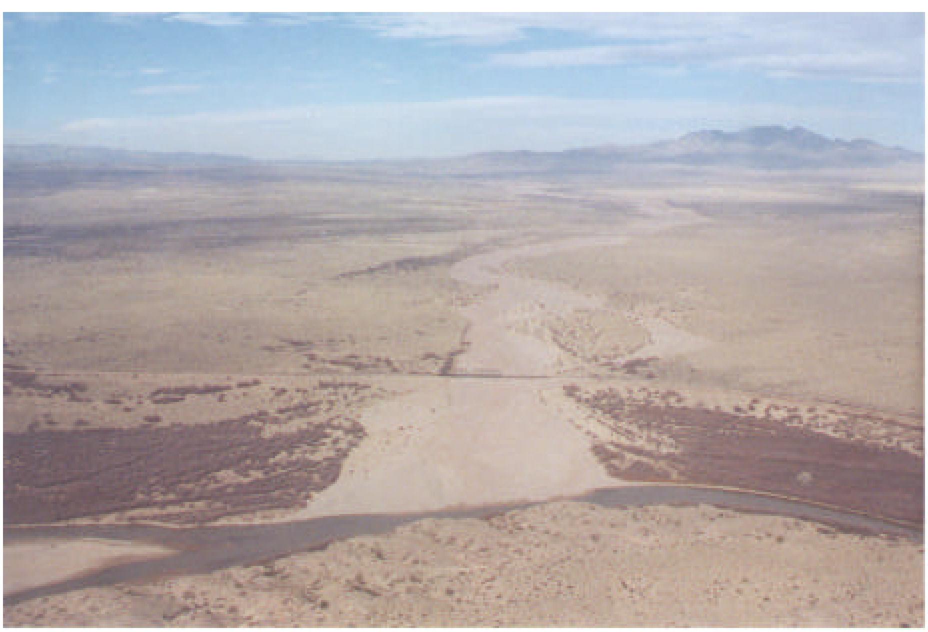
Station Name: Rio Puerco near Bernardo
Station Number: 08353000
Latitude: 342433 N
Longitude: 1065109 W
Elevation: 4722.34 feet above NGVD
Period of Record: 1940 - present
Data Source: USGS

Figure 4.8

Rio Salado



Station Name: Rio Salado near San Acacia
Station Number: 08354000
Latitude: 341750 N
Longitude: 1065359 W
Elevation: 4765 feet above NGVD
Period of Record: 1948 - 1984
Data Source: USGS



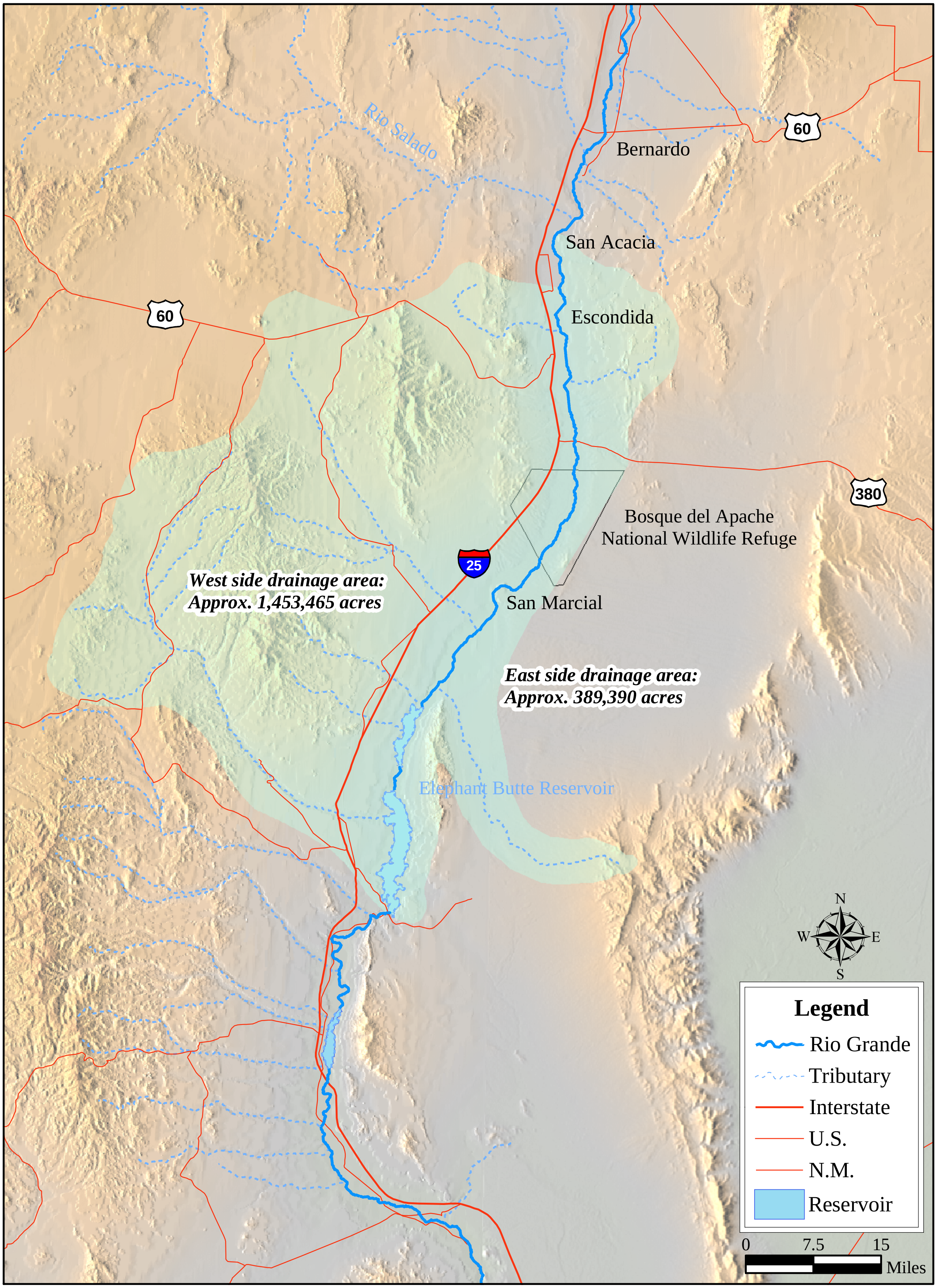
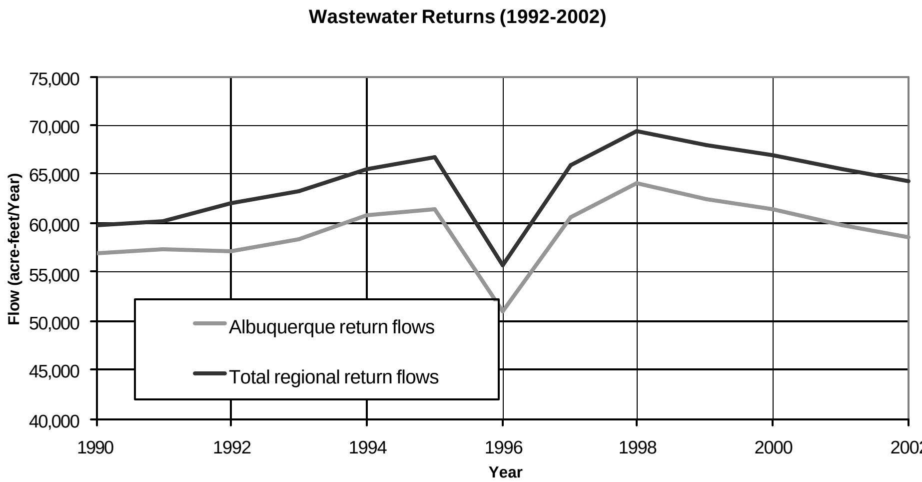


Figure 4.9 Ungaged Eastern and Western Tributary Basins South of Rio Salado

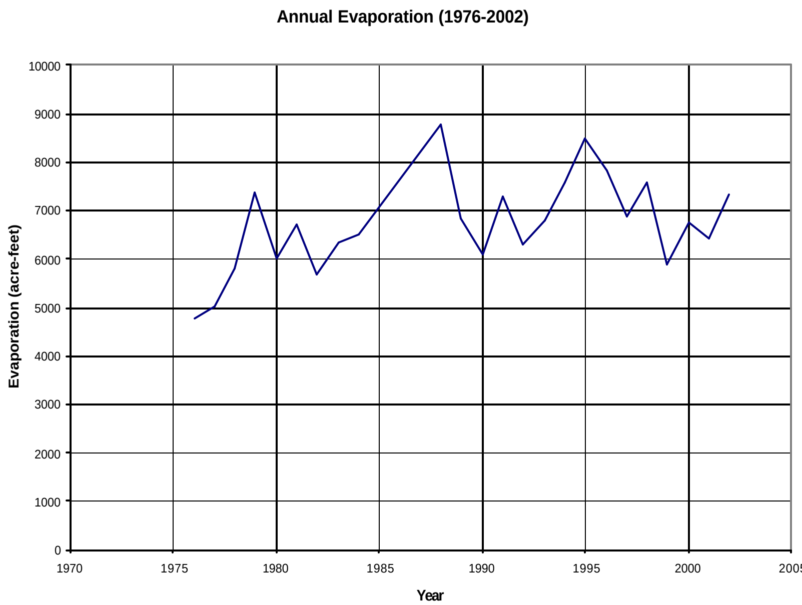
Figure 4.10
Wastewater Returns



Title: Wastewater Returns
Period of Record: 1992 - present
Data Source: USEPA
Comments: Composite of reported discharges under NPDES permits for cities of Albuquerque, Rio Rancho, Bernalillo, Los Lunas, Belen and Socorro

Figure 4.11

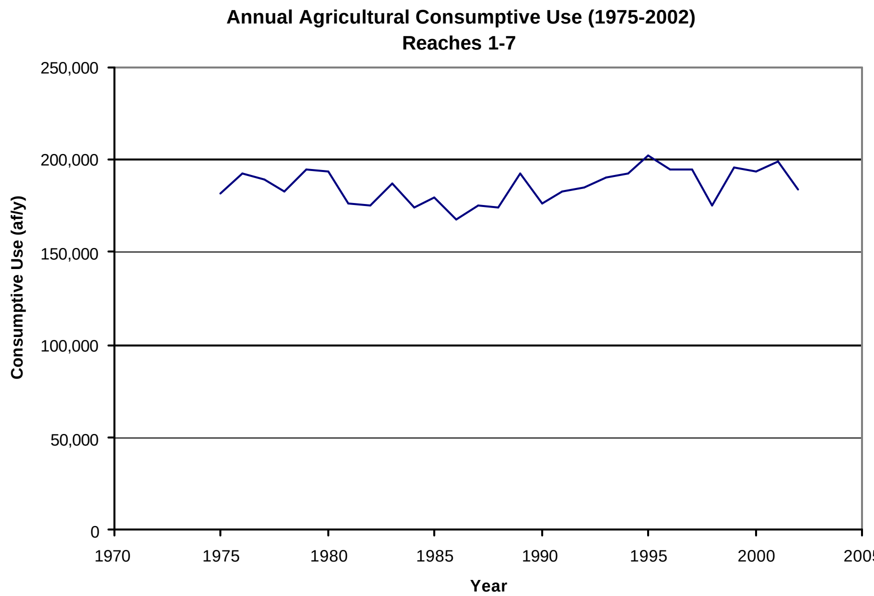
Cochiti Evaporation



Title: Evaporation from Cochiti Lake
Period of Record: 1976 - present
Data Source: U.S. Army Corps of Engineers

Figure 4.12

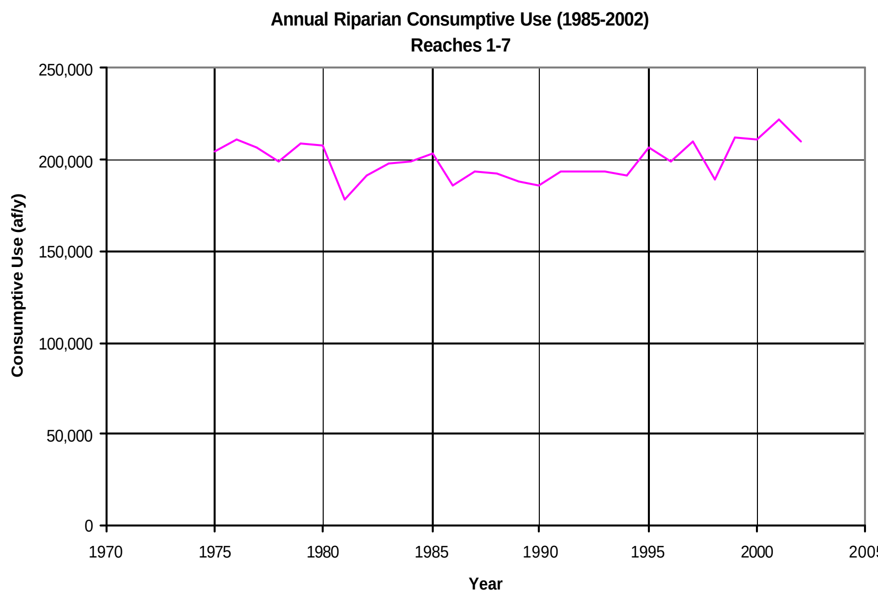
MRG Basin Agricultural Consumptive Use



Title: Agricultural Consumptive Use above San Acacia
Period of Record: 1975 - present
Data Source: USBR (ET Toolbox website, Jan. 2003)

Figure 4.13

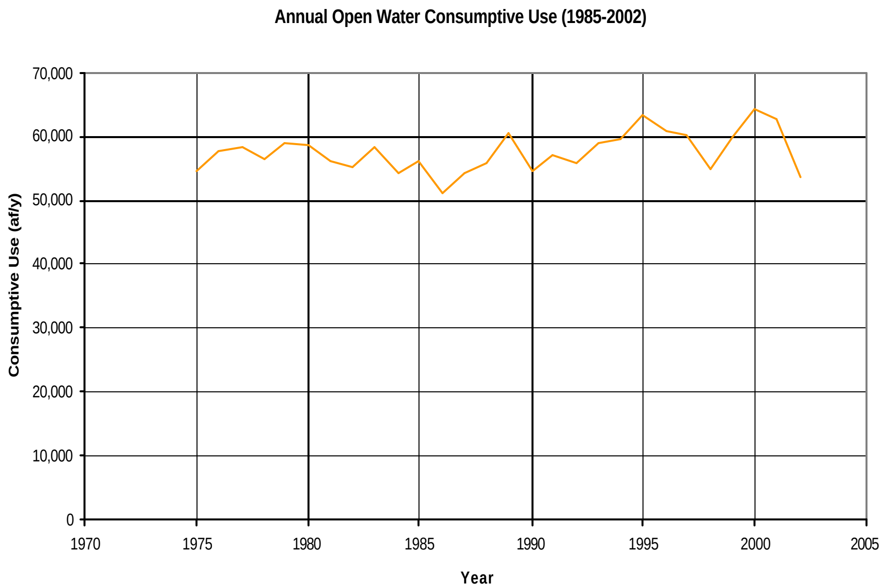
MRG Basin Riparian Consumptive Use

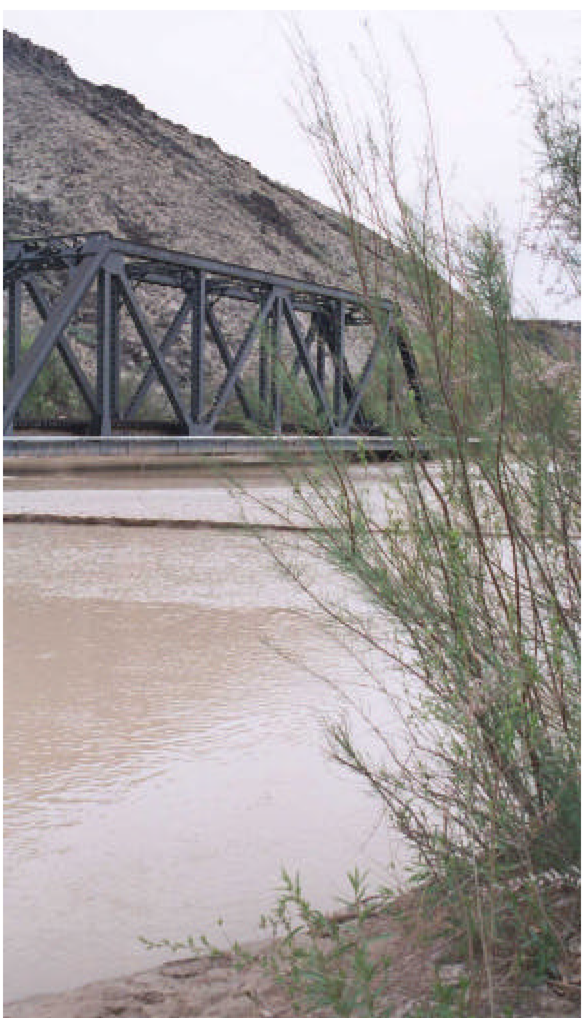


Title: Riparian Consumptive Use above San Acacia
Period of Record: 1975 - present
Data Source: USBR (ET Toolbox website, Jan. 2003)

Figure 4.14

MRG Basin Open Water Consumptive Use

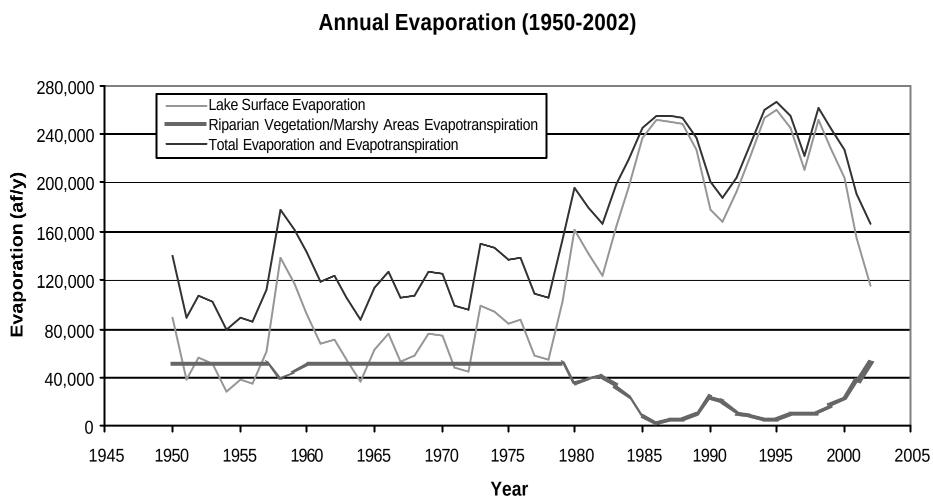




Title: Open Water Consumptive Use
Period of Record: 1975 - present
Data Source: USBR (ET Toolbox website, Jan. 2003)

Figure 4.15

Elephant Butte Evaporation



Title: Evaporation from Elephant Butte Reservoir
Period of Record: 1940 - present
Data Source: USBR

Figure 4.16
Modeled Basin-wide Total Inflow and Inflow Minus Compact Obligations

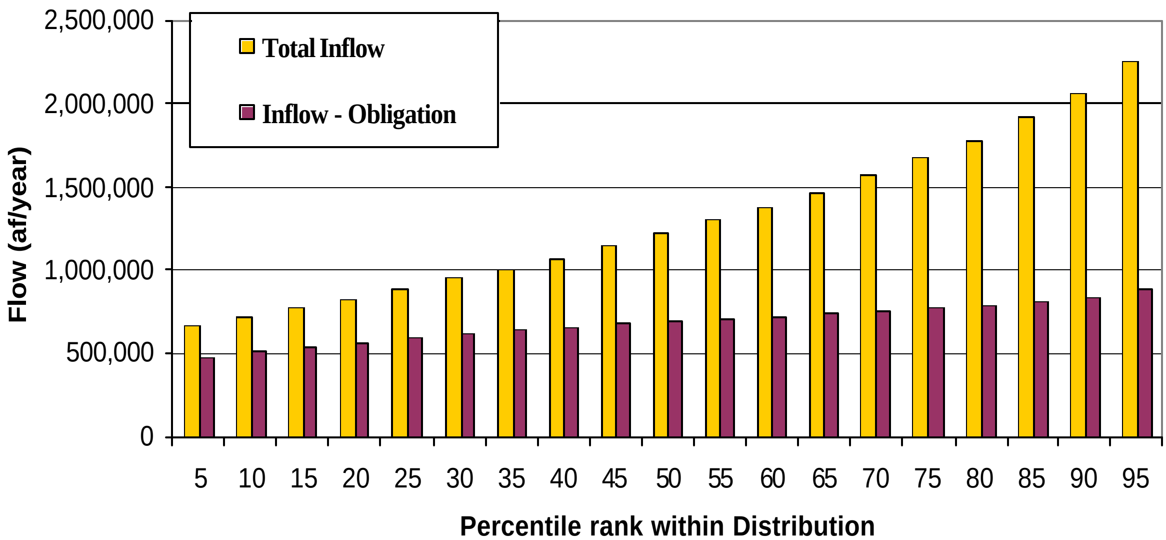


Figure 4.17
Modeled Otowi Index Supply

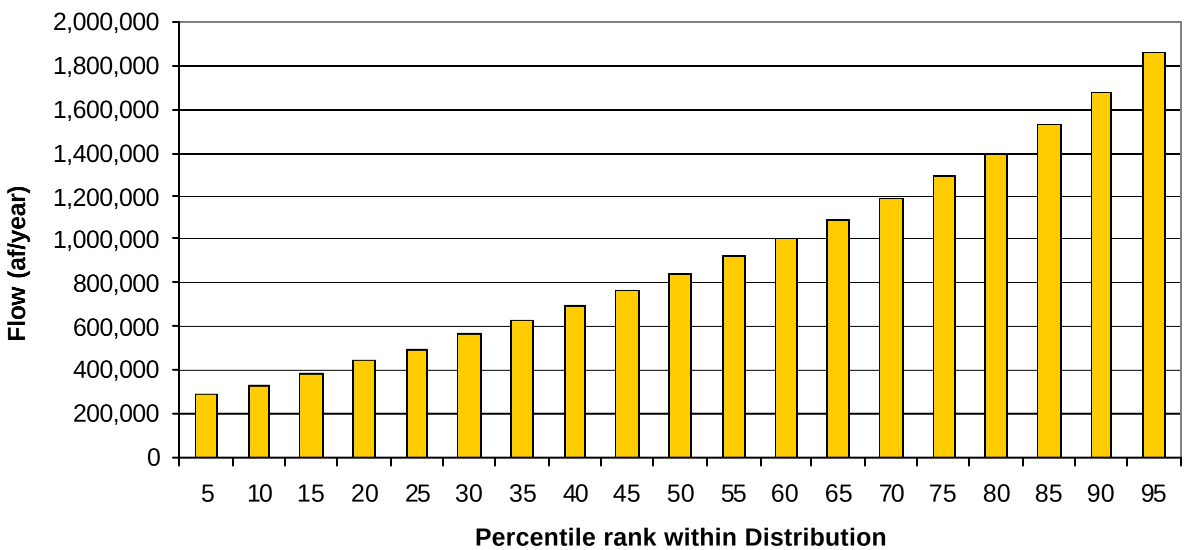


Figure 4.18
Modeled San Juan-Chama Project Inflow

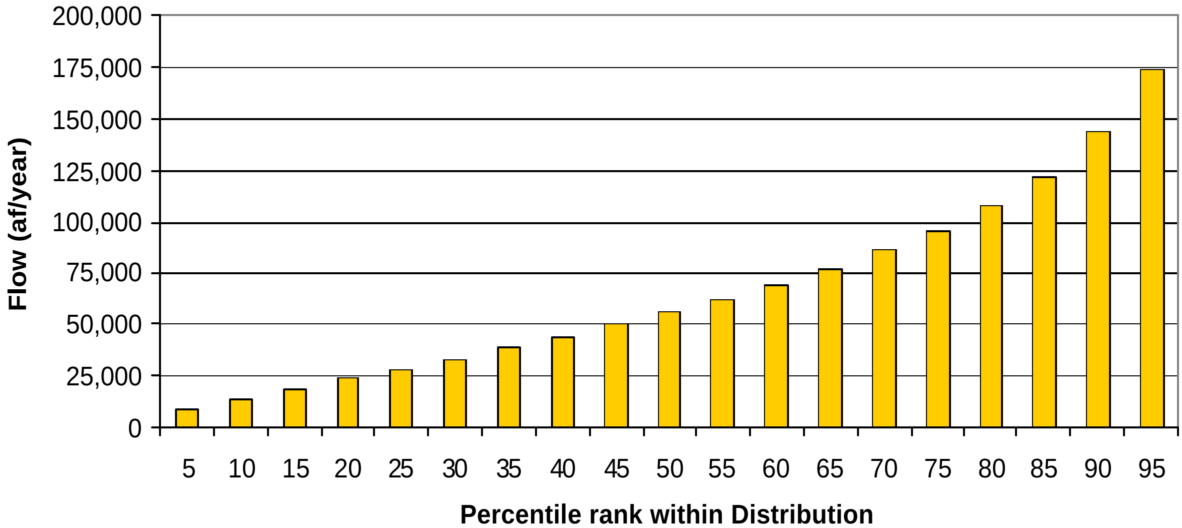


Figure 4.19
Modeled Section 1 Tributary Inflow

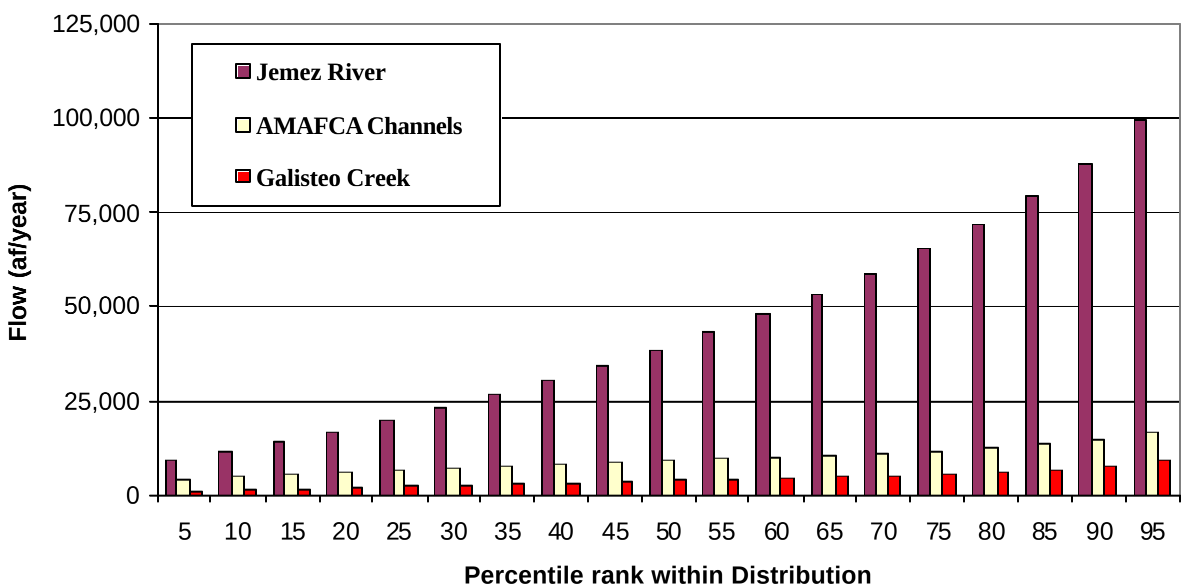


Figure 4.20
Modeled Sections 2 and 3 Tributary Inflow

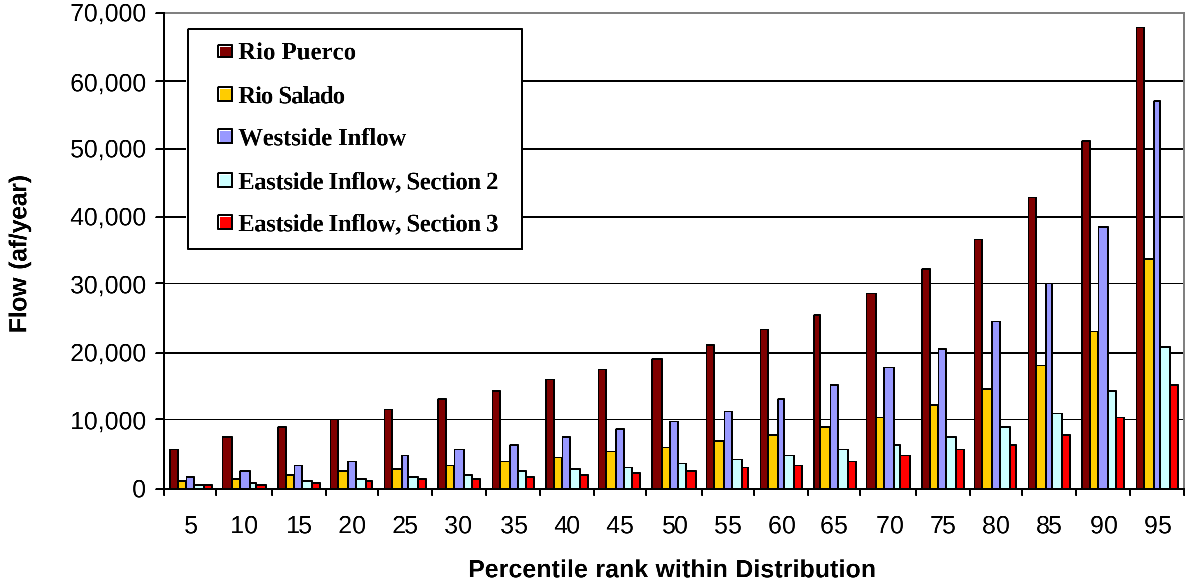


Figure 4.21
Modeled Basin-wide Available Inflow and Depletions

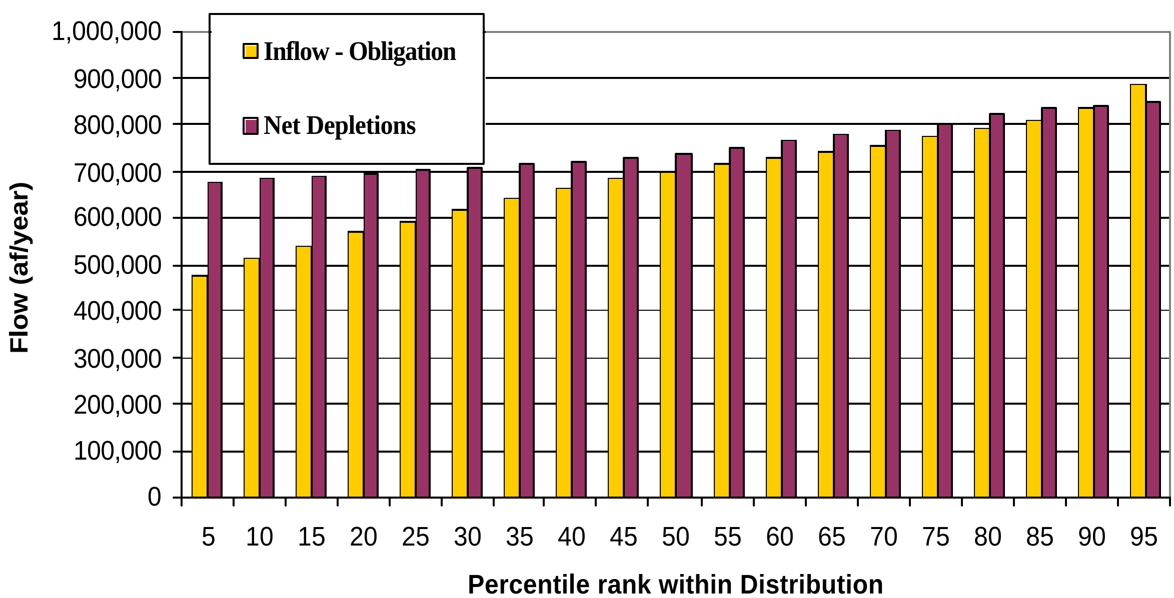


Figure 4.22
Modeled Elephant Butte Losses

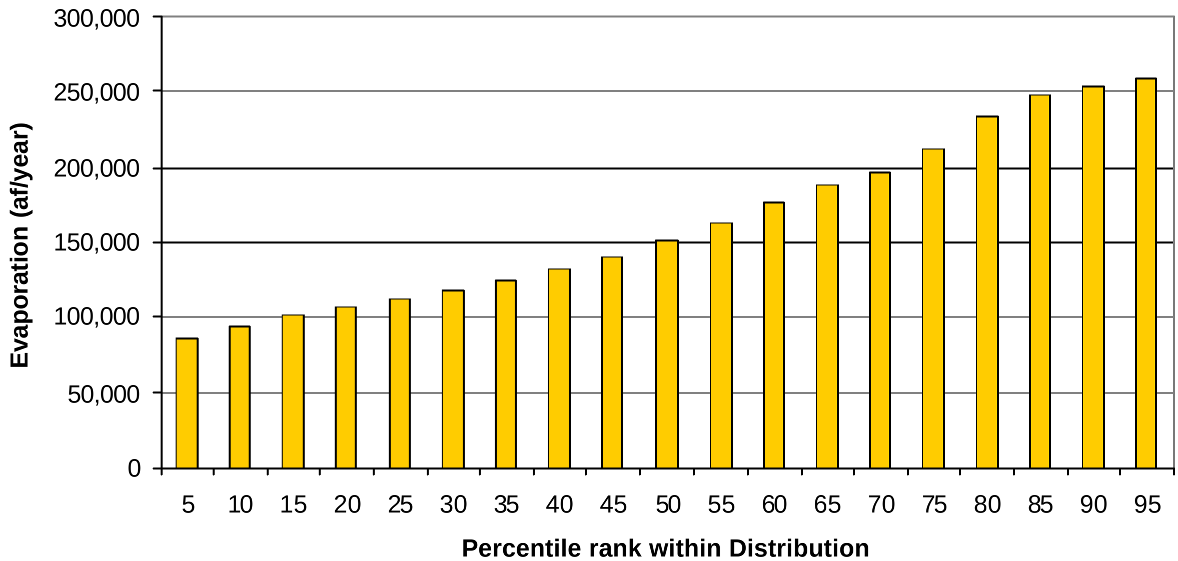


Figure 4.23
Total Agricultural, Riparian and Open Water Consumptive Use

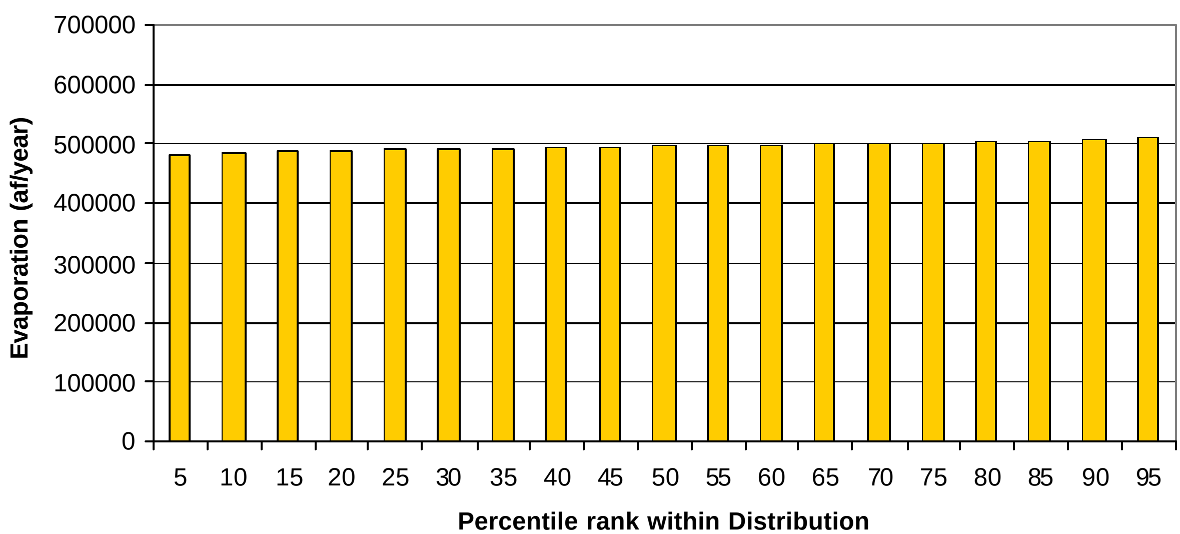


Figure 4.24

Base-Case Credit-Debit

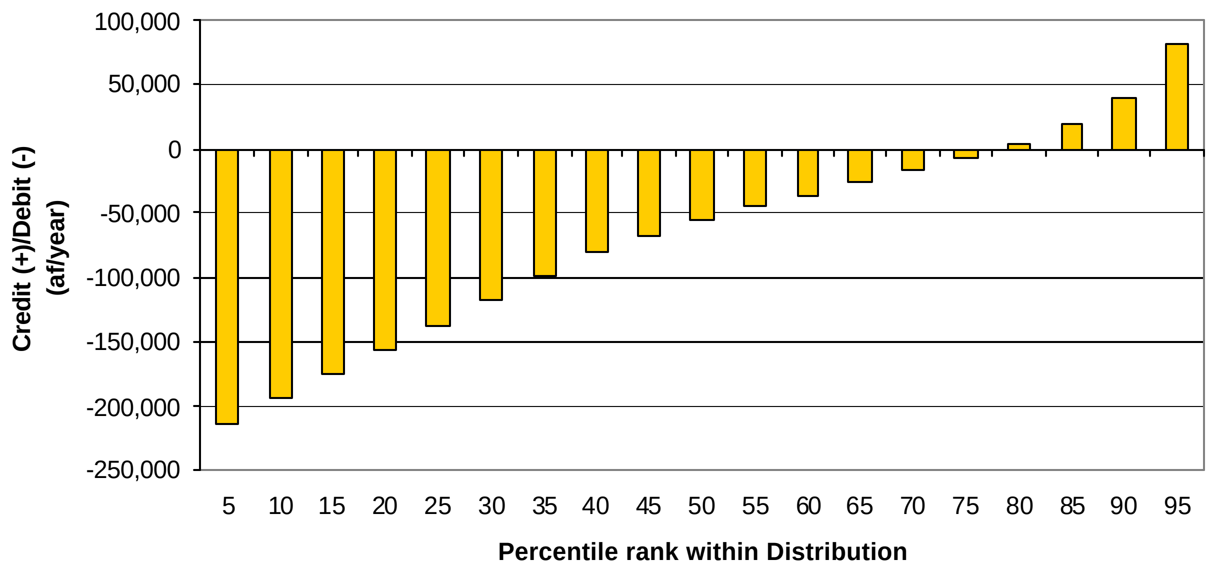


Figure 4.25
Mean Annual Middle Rio Grande Water Supply Under Present Conditions

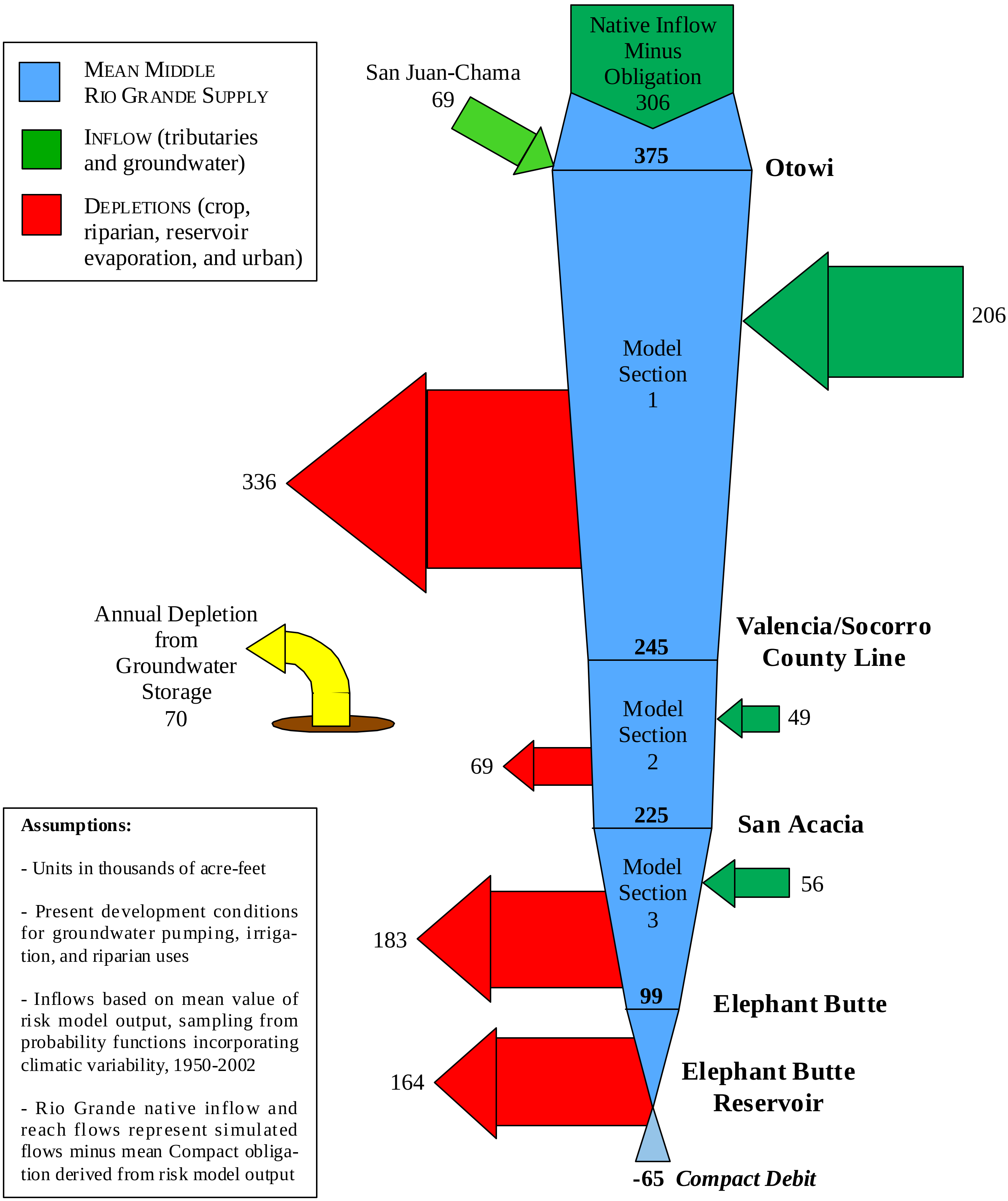


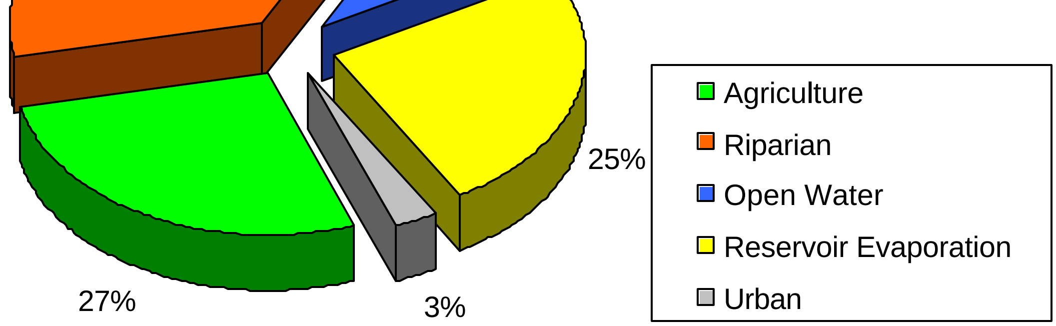
Figure 4.26

Summary of Mean Depletions, Grouped by Use

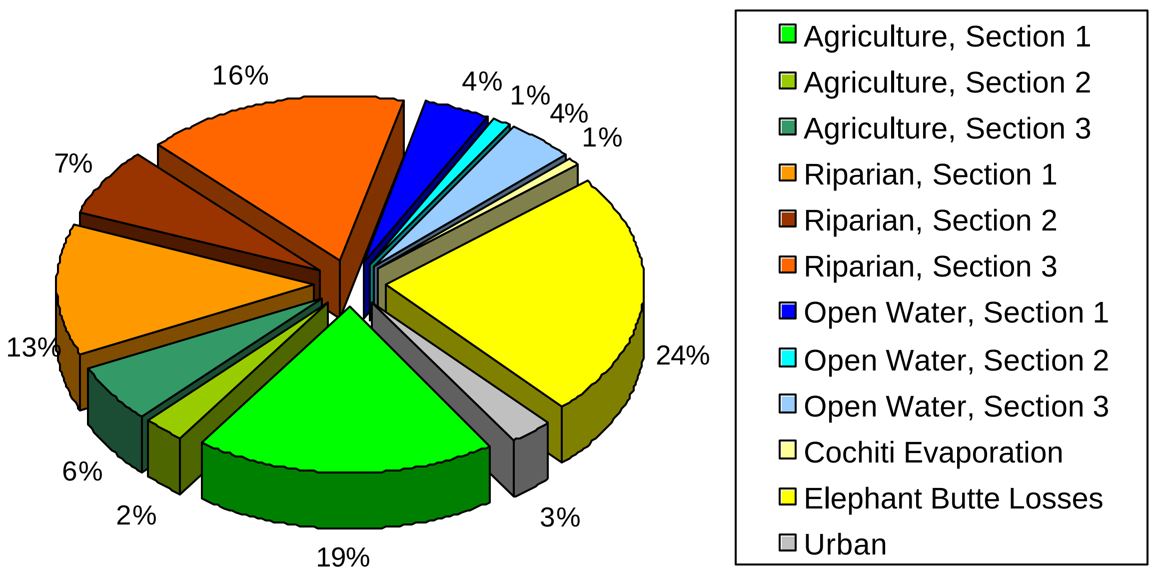
a) Mean depletions to River System (acre-feet per year)
(Year 2000 Land Use and Groundwater Development Conditions)

Note: Shown are percentages of total mean river depletions of approximately 685,400 acre-feet per year

Additional depletions of 70,000 acre-feet per year are presently occurring to aquifer



b) Mean depletions to River System (acre-feet per year), Detailed View



*Sections are:

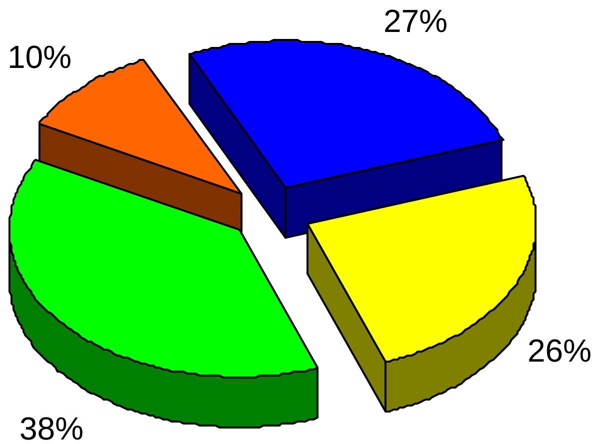
Model section 1 – Cochiti to Valencia/Socorro county line
Model section 2 – Valencia/Socorro county line to San Acacia
Model section 3 – San Acacia to Elephant Butte Reservoir

Summary of Mean Depletions, Grouped by Geographic Section*

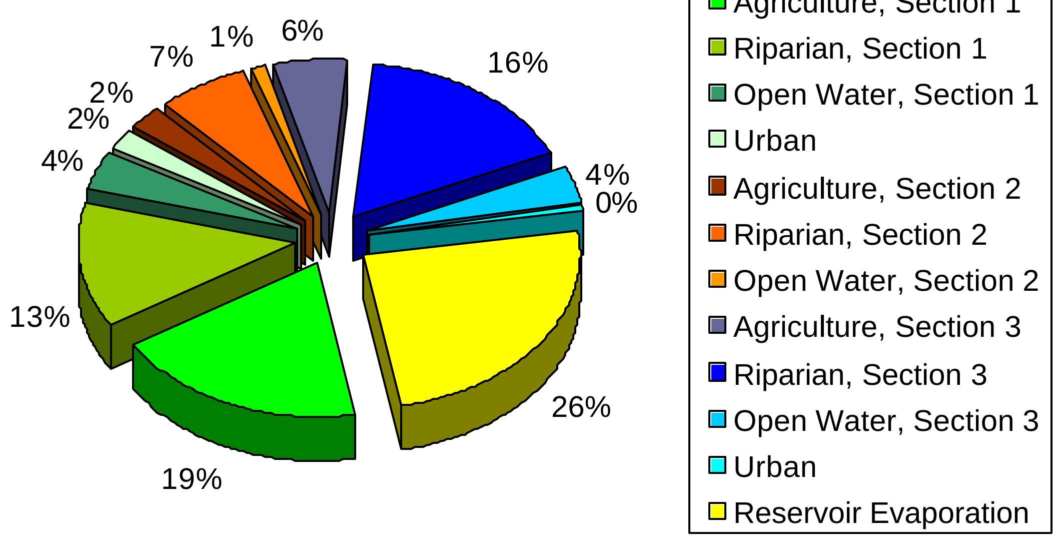
a) Mean depletions to River System (acre-feet per year)
(Year 2000 Land Use and Groundwater Development Conditions)

Note: Shown are percentages of total mean river depletions of approximately 685,400 acre-feet per year

Additional depletions of 70,000 acre-feet per year are presently occurring to aquifer



b) Mean depletions to River System (acre-feet per year), Detailed View



*Geographic sections are:

Model section 1 – Cochiti to Valencia/Socorro county line
Model section 2 – Valencia/Socorro county line to San Acacia
Model section 3 – San Acacia to Elephant Butte Reservoir

Table 4.1

Water Budget Flow and Depletion Terms

Adjusted Inflow, Model Section 1	Otowi Index Supply minus Obligation minus Elephant Butte Evaporation San Juan-Chama flow Santa Fe River above Cochiti Jemez River Galisteo Creek AMAFCA Channels Wastewater returns above county line Net groundwater inflow above San Acacia Effective precipitation above county line
Depletions, Model Section 1	Cochiti evaporation Santa Fe depletions Groundwater pumping depletions above county line Agricultural consumptive use above county line Riparian consumptive use above county line Open water consumptive use above county line Ungaged tributaries east of Rio Grande
Outflow from Model Section 1	Equals Adjusted Section 1 Inflow – Section 1 Depletions
Adjusted Inflow, Model Section 2 and 3	Section 1 Outflow Rio Puerco Rio Salado Wastewater returns below county line Ungaged tributaries west of the Rio Grande Ungaged tributaries east of the Rio Grande Net groundwater inflow below San Acacia Effective precipitation below county line
Depletions, Model Section 2 and 3	Groundwater pumping depletions below county line Agricultural consumptive use below county line Riparian consumptive use below county line Open water consumptive use below county line
Section 3 Outflow	Equals New Mexico Compact Credit/Debit

Note: Section 1 – Otowi to County Line
Section 2 – County Line to San Acacia
Section 3 – San Acacia to Elephant Butte

Table 4.2

Inflow and depletion terms, in acre-feet per year, used in the Phase 2 and Phase 3 modeling.

Inflow term	Phase 2 Distribution				Phase 3 Distribution			
	Distribution	m	s	**Dependency**	**Distribution**	m	s	**Dependency**
Otowi Index Supply	296500 + Beta(0.844,1.522) * 1872965	964,624	489,031		254000 + Beta(0.8735, 1.5947) * 1920000	930,084	493,352	
San Juan-Chama Project water	Static = 75,844				Gamma(1.545,46327, Truncate(0,255000))	68,613	51,348	-0.58 of Otowi Index
Santa Fe River above Cochiti	Static = 9,956				Static = 9,580			
Jemez River	7748 + Beta(0.807,1.631) * 115152	45,636	28,040	0.8805 on Otowi Index	(7740 + Beta(0.7933, 1.6992)* 115000)	44,750	28,726	0.85 on Otowi Index
Galisteo Creek	Gamma(3.44,1300, Truncate(928,9505))	4,469	2,360		Weibull(1.7365,4748, Truncate(0,20000))	4,225	2,509	
AMAFCA Channels	Uniform(3072,17845)	10,459	4,265		Gamma(5.62,1692, Truncate(0,36000))	9,519	3,999	
Effective precipitation, entire region	Static = 38,535				Static = 46,698			
Wastewater returns, entire region	Static = 68,941				Static = 66,734			
Rio Puerco	Pearson6(8.15,4.37,11609, Truncate(4753,115422))	30,966	27,107		Lognormal(25832,22432, Truncate(0,230000))	25,645	21,735	
Rio Salado	Pearson6(2.95,2.40,5343, Truncate(110,100000))	10,345	13,449	0.6688 on Rio Puerco	Lognormal(10542,15311, Truncate(0,160000))	10,393	13,830	0.56 on Rio Puerco
Ungaged Tributaties (Westside Inflow)	Pearson6(2.95,2.40,5343, Truncate(110,100000)) * 1.5	15,518		0.5 on Rio Salado	Lognormal(10542,15311, Truncate(0,160000))*1.65	17,090	21,560	0.4 on Rio Puerco
Eastside inflow, Section 1					Static = 420			
Eastside inflow, Section 2					Lognormal(10542,15311, Truncate(0,160000))*0.61	6,381	8,407	0.3 on Rio Puerco
Eastside inflow, Section 3	Pearson6(2.95,2.40,5343, Truncate(110,100000)) /1.02	10,552		0.5 on Rio Salado	Lognormal(10542,15311, Truncate(0,160000))*0.44	4,602	6,064	0.3 on Rio Puerco
Groundwater inflow above San Acacia	Static = 91,589				Static = 49,940			
Groundwater inflow below San Acacia	Static = 16,500				Static = 16,500			
Cochiti Evaporation	Loglogistic(4770,2482,2.46, Truncate(4770, 20220))	7,827	2,235		Normal(6708,977)	6,708	977	
Santa Fe GW pumping depletions	Static = 2,400				Static = 2,587			
GW pumping depletions above San Acacia	Static = 94,360				Static = 79,600			
Agricultural ET, entire region	Weibull distribution	248,096		-0.3622 on Otowi Index	Normal(185848, 9101)	185,848	9,101	-0.43 on Rio Puerco
Riparian and Open Water ET, entire region	Logistic distribution	246,500			Static = 310,410			
GW pumping depletions below San Acacia	Static = 2,507				Static = 3,300			
Elephant Butte Evaporation	Histogram(28254,260094, {7,12,7,3,3,3,1,3,3,7})	123,119	74,347	0.4965 on Otowi Index	Histogram(79360,265949, {7,10,7,5,4,6,2,3,9})	163,577	58,323	0.46 on Otowi Index

Mean (μ) and Standard Deviation (σ) given in af/y.

Table 4.3

Agricultural Consumptive Use

Model Section	Irrigated Agricultural Acreage	ET Rate (af/acre/y)	Potential CU (af/y)	Adjusted ET rate (af/acre/y)	Adjusted CU (af/y)
1 - Cochiti to Socorro County Line	44,291	3.93	173,965	2.95	130,473
2 - Socorro County Line to San Acacia	5,719	3.93	22,494	2.95	16,870
3 - San Acacia to Elephant Butte Res.	13,490	3.80	51,320	2.85	38,490

Table 4.4

Riparian Consumptive Use

Model Section	Riparian Acreage	ET Rate (af/acre/y)	Riparian CU (af/y)
1 - Cochiti to Socorro County Line	24,565	3.62	89,032
2 - Socorro County Line to San Acacia	12,400	3.62	44,829
3 - San Acacia to Elephant Butte Res.	28,198	4.00	112,792

Table 4.5

Open Water Consumptive Use

Model Section	Open Water Acreage	ET Rate (af/acre/y)	Open Water CU (af/y)
1 - Cochiti to Socorro County Line	5,088	5.52	28,106
2 - Socorro County Line to San Acacia	1,397	5.57	7,787
3 - San Acacia to Elephant Butte Res.	4,947	5.63	27,863

Table 4.6
Detailed Base-Case Model Statistical Output (Page 1 of 4)

Name	Total Inflow	Obligation	Inflow - Obligation	Net Depletions	Credit/ Debit	OTOWI Index Supply	San Juan - Chama	Jemez River
Mean	1,311,174	624,104	687,070	751,971	-64,901	930,084	68,613	44,750
Std Deviation	498,928	406,296	127,562	58,943	96,223	493,352	51,348	28,726
Minimum	513,628	144,796	368,670	642,763	-296,651	254,028	28	7,740
5%	668,038	165,359	474,289	673,806	-214,776	290,103	8,767	9,320
10%	721,335	191,242	510,440	682,367	-194,420	335,512	14,159	11,468
15%	772,970	220,119	539,516	688,731	-175,182	386,174	19,310	14,045
20%	829,354	253,733	568,715	694,967	-157,087	444,368	23,903	16,818
25%	886,207	286,883	593,033	700,924	-138,243	501,497	28,520	19,885
30%	949,621	324,036	617,528	706,432	-117,791	564,467	33,545	23,313
35%	1,009,334	364,854	642,052	713,392	-99,237	632,548	38,991	26,943
40%	1,072,671	407,156	662,613	721,287	-81,253	701,778	44,504	30,573
45%	1,148,055	453,250	682,252	729,863	-67,281	772,692	49,974	34,317
50%	1,228,124	504,640	698,604	739,797	-55,273	847,381	56,208	38,617
55%	1,302,363	561,962	713,749	751,973	-44,947	925,268	62,792	43,623
60%	1,379,327	622,709	727,475	765,269	-35,448	1,001,987	69,695	48,299
65%	1,466,984	697,424	741,136	776,535	-26,196	1,088,865	77,192	53,209
70%	1,569,495	788,582	757,262	786,717	-17,256	1,187,722	86,228	58,519
75%	1,674,796	891,741	771,511	800,862	-7,527	1,294,579	95,941	65,102
80%	1,784,627	994,712	789,086	820,636	3,779	1,398,699	107,364	71,997
85%	1,914,939	1,124,126	809,442	833,406	18,500	1,529,126	122,071	79,646
90%	2,067,530	1,274,158	835,774	841,563	40,230	1,679,158	143,722	88,241
95%	2,252,092	1,451,702	884,600	849,860	82,636	1,856,702	174,310	99,705
Maximum	2,787,037	1,763,029	1,388,173	879,642	620,268	2,168,029	254,489	122,448

Table 4.6
Detailed Base-Case Model Statistical Output (Page 2 of 4)

Name	Galisteo Creek	AMAFCA Channels	Rio Puerco	Rio Salado	Westside Inflow	Eastside Inflow, Section 2	Eastside Inflow, Section 3
Mean	4,225	9,519	25,645	10,393	17,090	6,381	4,602
Std Deviation	2,509	3,999	21,735	13,830	21,560	8,407	6,064
Minimum	38	924	913	93	219	35	25
5%	881	4,016	5,720	1,038	1,712	636	458
10%	1,337	4,830	7,466	1,508	2,511	935	675
15%	1,675	5,533	8,868	1,967	3,241	1,191	859
20%	2,012	6,126	10,252	2,398	4,022	1,489	1,074
25%	2,340	6,615	11,658	2,939	4,790	1,773	1,279
30%	2,627	7,103	13,077	3,477	5,618	2,087	1,505
35%	2,912	7,580	14,436	4,017	6,524	2,459	1,774
40%	3,200	8,005	15,891	4,595	7,556	2,817	2,032
45%	3,511	8,450	17,399	5,261	8,643	3,215	2,319
50%	3,819	8,965	19,122	6,031	9,901	3,690	2,662
55%	4,164	9,489	21,191	6,920	11,378	4,193	3,025
60%	4,510	9,974	23,234	7,858	13,147	4,811	3,470
65%	4,885	10,554	25,690	9,114	15,094	5,571	4,018
70%	5,257	11,167	28,657	10,528	17,650	6,495	4,685
75%	5,682	11,857	32,390	12,278	20,582	7,615	5,492
80%	6,197	12,607	36,578	14,520	24,498	8,988	6,483
85%	6,820	13,590	42,739	17,948	30,117	11,080	7,992
90%	7,661	14,811	51,197	23,032	38,534	14,322	10,331
95%	8,998	16,852	67,775	33,776	56,938	20,868	15,052
Maximum	17,119	34,182	220,113	159,293	262,398	95,135	68,622

Table 4.6
Detailed Base-Case Model Statistical Output (Page 3 of 4)

Name	Cochiti Evaporation	Agricultural ET, Section 1	Agricultural ET, Section 2	Agricultural ET, Section 3	Elephant Butte Losses base case	Elephant Butte Losses, SSPR Alternative 1A	Section 1 Adjusted Inflow
Mean	6,716	130,048	16,720	39,014	163,577	151,692	419,867
Std Deviation	971	6,436	827	1,931	58,323	63,343	74,869
Minimum	2,996	105,547	13,570	31,664	79,374	62,339	232,165
5%	5,085	119,380	15,349	35,814	86,331	69,859	294,841
10%	5,463	121,927	15,676	36,578	94,012	78,160	312,133
15%	5,718	123,463	15,874	37,039	101,644	86,257	322,484
20%	5,914	124,710	16,034	37,413	107,082	91,600	334,068
25%	6,070	125,752	16,168	37,726	112,256	96,684	349,005
30%	6,217	126,722	16,293	38,017	117,690	102,023	365,614
35%	6,352	127,577	16,403	38,273	124,644	107,952	387,051
40%	6,471	128,435	16,513	38,530	132,335	115,226	409,220
45%	6,601	129,228	16,615	38,768	139,950	122,427	429,214
50%	6,722	130,017	16,716	39,005	150,963	131,053	445,505
55%	6,834	130,865	16,826	39,260	163,101	147,233	454,825
60%	6,968	131,676	16,930	39,503	176,592	165,101	463,231
65%	7,101	132,514	17,037	39,754	187,810	180,577	470,268
70%	7,235	133,366	17,147	40,010	196,902	192,369	476,355
75%	7,382	134,314	17,269	40,294	211,999	210,184	481,764
80%	7,540	135,395	17,408	40,619	234,140	227,007	487,779
85%	7,722	136,667	17,571	41,000	247,794	241,922	495,607
90%	7,960	138,274	17,778	41,482	253,611	248,994	502,914
95%	8,275	140,676	18,087	42,203	259,690	256,386	511,221
Maximum	10,585	154,014	19,802	46,204	265,940	263,986	649,482

Table 4.6
Detailed Base-Case Model Statistical Output (Page 4 of 4)

Name	Section 1 Depletion	Section 1 Outflow	SSPR Inflow to Region	SSPR Depletion	SSPR Outflow (Equals Credit/Debit)	SSPR Inflow, All Alternatives	SSPR Outflow, All Alternatives
Mean	336,089	83,779	187,405	252,306	-64,901	223,995	-28,311
Std Deviation	6,514	75,085	96,518	2,758	96,223		
Minimum	312,500	-102,398	-44,768	241,805	-296,651	-3,030	-254,960
5%	325,344	-41,219	36,919	247,734	-214,776	76,734	-176,039
10%	327,841	-24,858	57,597	248,825	-194,420	96,461	-155,908
15%	329,414	-12,977	76,828	249,484	-175,182	115,178	-136,961
20%	330,673	-1,946	95,136	250,018	-157,087	132,972	-118,919
25%	331,777	12,731	114,321	250,465	-138,243	152,048	-99,947
30%	332,742	30,148	133,986	250,881	-117,791	171,896	-80,516
35%	333,616	51,456	152,952	251,247	-99,237	190,458	-61,898
40%	334,451	73,226	171,067	251,614	-81,253	206,680	-45,776
45%	335,286	93,713	184,979	251,954	-67,281	219,848	-32,650
50%	336,048	108,297	196,826	252,292	-55,273	230,910	-21,399
55%	336,918	118,453	207,254	252,656	-44,947	240,990	-10,807
60%	337,705	126,575	216,437	253,003	-35,448	251,410	-651
65%	338,563	133,533	225,569	253,363	-26,196	261,397	8,952
70%	339,401	139,879	234,611	253,728	-17,256	270,999	18,891
75%	340,419	145,909	244,387	254,134	-7,527	281,244	29,028
80%	341,472	152,222	255,991	254,598	3,779	292,309	39,843
85%	342,786	159,328	270,912	255,143	18,500	307,374	54,786
90%	344,401	167,212	293,032	255,831	40,230	329,161	76,415
95%	346,837	176,095	335,112	256,861	82,636	370,182	116,879
Maximum	361,201	300,515	878,921	262,577	620,268	920,486	661,833

5.0 REGIONAL WATER PLANNING ALTERNATIVES

A key element of the Middle Rio Grande Water Supply Study, Phase 3, involves providing technical support to the Middle Rio Grande Planning Region (MRGPR) and the Socorro-Sierra Planning Region (SSPR) in evaluation of their respective regional water planning alternatives. The areas of technical support includes assisting the regions in interpretation of hydrology and water resources relevant to their planning region, and evaluation of water supply alternatives developed by the regions, particularly with respect to overall basin-wide water supply and Rio Grande Compact limitations.

This section describes the analyses conducted of alternatives posed separately by each planning region, and joint evaluation of the combined alternatives from both regions. The analyses utilize the probabilistic water budget model described in Section 4, with modifications as needed to evaluate the proposed alternatives. Preliminary supporting work also has been provided to the planning regions periodically as they have worked to develop their alternatives. Supporting documentation produced during the alternative development period, where applicable, will be cited in the discussion in this section and is provided in Appendices G and H of this report.

5.1 Middle Rio Grande Planning Region

5.1.1 Background

5.1.2 Hydrologic Assessment of Alternatives

5.1.3 Modification of the Water Budget Model for Alternatives Analysis

5.1.4 Results of Quantitative Evaluation of Middle Rio Grande Planning Region Alternatives

5.2 Socorro-Sierra Planning Region

5.2.1 Background

In February of 2003, the Socorro-Sierra Planning Region (SSPR) finalized a list of 16 water planning alternatives. Of these 16, five alternatives involved changes to the regional water budget and were considered amenable to analysis using tools developed under this study. These alternatives are:

1. Evaporation control through reduced water surface areas in engineered and natural areas
2. Improve efficiency of surface water conveyance systems to agricultural land, including irrigation scheduling, metering, and ditch lining or piping
3. Improve on-farm efficiency
4. Control brush and weeds along water distribution systems and drains
5. Remove exotic vegetation (i.e. Salt cedar, Russian olive) on wide scale

Other alternatives were retained for evaluation by the SSPR and are not discussed in this section. A broader discussion of alternatives considered during the development process and a preliminary screening evaluation of many of these alternatives is contained within memoranda prepared for the SSPR, dated September 23, 2002 and March 7, 2003 (Appendix H). The March 7, 2003 memorandum provides preliminary quantitative estimates that were utilized by the SSPR in refining assumptions for the final alternatives posed for analysis and presented herein. Communications and review of subsequent preliminary analyses with the SSPR supported a process wherein some of the preliminary assumptions were refined to better reflect the alternatives being framed by the SSPR and to incorporate the local knowledge of the SSPR. A complete discussion of the alternatives, including those involving institutional controls, will be provided in the Socorro-Sierra Regional Water Plan, which is expected to be available by December 2004.

For the evaluation of the five alternatives identified above, the following analyses were performed:

- *Preparation of Alternatives*: Planning alternatives were evaluated to establish sensitivities and relationships between alternatives and between alternatives and other model parameters, with attention paid to how these sensitivities and relationships impact water consumption. Selected alternatives were grouped if appropriate.
- *Model Set-Up and Analyses*: Modifications were made to the basin-wide probabilistic water budget model to reflect the proposed alternatives. Additional modifications were made to the model to provide results in the context of the regional water supply and to include impacts on Compact obligations.
- *Evaluation of Regional Water Budget Terms and their Variation*: The regional water budget was evaluated as a subset of the basin-wide water budget to facilitate a comparison of supply and demand in the planning region. The various alternatives are described in terms of how they impact the regional water inflows (and outflows) and variations of these flows.

For this analysis, the downstream flow requirements (Compact obligation and anticipated Elephant Butte losses) were removed upfront from the upstream inflow to the study area. With this methodology, the "inflow" to the SSPR can be conceptualized as the Rio Grande flow at the Socorro county line, minus Compact obligation and Elephant Butte losses, plus inflows occurring below the county line. Though from a geographical or physical point of view some would characterize this quantity as *supply* to the Socorro-Sierra Planning Region, the validity of claims to such waters are subject to state laws of appropriation and the right to use waters will not strictly coincide with physical areas of inflow. The identification of regional water inflow in this report is described solely from a physical viewpoint.

5.2.2 Hydrologic Assessment of Alternatives

All five of the planning alternatives listed above were reviewed to assess hydrologic impacts on consumptive use. Alternative 1, evaporation control through reduced water surface areas, was subdivided into Alternatives 1A and 1B. Alternative 1A addresses reducing water surface areas and areas for potential riparian colonization in exposed portions of the Elephant Butte Reservoir north basin when the reservoir is at less than capacity. Alternative 1B addresses reducing water surface areas elsewhere in the planning region. Alternative 5 was subdivided into 3 options, A through C, based on the acreage of riparian vegetation removed, and the area from which it was removed. This subdivision is described in more detail under Alternative 5.

Alternative	Alternative Name
Alternative 1A	Evaporation control through reduced water surface areas in exposed portions of the Elephant Butte Reservoir
Alternative 1B	Evaporation control through reduced water surface areas elsewhere in the planning region
Alternatives 2, 3, and 4	Improve off-farm efficiency (includes irrigation scheduling, metering, ditch lining or piping) Improve on-farm efficiency Control brush and weeds along canals and drains
Alternative 5 – A, B, and C	Remove exotic vegetation on wide scale
All Alternatives – A, B, and C	Combined effects of Alternatives 1A, 1B, 2, 3, 4, and 5A/5B/5C

5.2.2.1 Alternative 1A: Evaporation Control in Exposed Areas of Elephant Butte Reservoir

Alternative 1A addresses evaporation control through reduction in open water evaporation and riparian colonization in exposed portions of the north basin of Elephant Butte Reservoir when reservoir levels are low. Drainage of a portion of the Elephant Butte delta and the exposed north basin is currently being undertaken by the State of New Mexico through construction of the Pilot Channel. As of July 23, 2003, this effort appears to have successfully drained several ponded areas in the portion of the north basin south of Nogal Canyon, and in general has improved flow and drainage in the areas where the channel has been completed. However, it appears that once areas are drained, or exposed by receding reservoir waters, salt cedar, and occasionally willow, colonize the area within about 3 months.

In implementing the SSPR Alternative 1A, drainage of the exposed portions of the northern basin, we have made the following assumptions:

- The state will complete the Pilot Channel through the north basin of Elephant Butte Reservoir, and will maintain the channel as long as the reservoir levels remain low;
- With the Pilot Channel in place, there will be little ponded water in the northern basin of the reservoir;
- In the absence of further intervention in the north basin, 90% of the exposed portion of the northern basin of Elephant Butte Reservoir is subject to colonization by riparian growth, with an evapotranspiration rate of 4 acre-feet per acre;
- With intervention[1], only 50% of the exposed portion of the northern basin of Elephant Butte Reservoir is subject to colonization by riparian growth, resulting in a savings of 1 acre-foot per acre of water (salt cedar, at a consumptive use of 4 acre-feet per acre, replaced with native vegetation at a consumptive use of 3 acre-feet per acre) over 40% of the total north basin acreage. Total north basin acreage is 14,196 acres (taken from DEM of reservoir – see section 4.4.5).

In the Base Case model analysis (Section 4), riparian evapotranspiration from the north basin area of Elephant Butte is included in the Elephant Butte Losses term. For the Base Case it is assumed that evapotranspiration losses occur on 90% of the exposed portion of the north basin. An alternate distribution was calculated for Alternative 1A under the

[1] "Intervention" could be in the form of salt cedar removal and replacement with native riparian vegetation, or in the form of active drainage projects (i.e. lowering the Pilot Channel at the northern end of the reservoir so as to lower the water table in the area, potentially reducing riparian habitat).

assumption that intervention reduces evapotranspiration losses by 1 acre-foot per acre over 40% of the exposed north basin area, while 50% of the exposed north basin area continues to experience 4 acre-feet per acre of evapotranspiration.

5.2.2.2 Alternatives 1B: Evaporation Control Through Reduced Water Surface Areas Elsewhere in the Planning Region

In implementing the SSPR Alternative 1B, evaporation control through reduced water surface areas elsewhere in the planning region, the following assumptions are made:

- Open water acreage below the Socorro county line and the north end of Elephant Butte Reservoir is 6,344 acres;
- 10% of the open water acreage, or 634 acres, could be converted to native bosque;
- Open water evaporation for this area is 5.6 acre-feet per acre (average annual ET Toolbox ET rate for open water for the *Bernardo to San Acacia* and *San Acacia to San Marcial* reaches);
- Native bosque evapotranspiration for this area is 3 acre-feet per acre (King and Bawazir, 2000).

Based on these assumptions, the resulting water savings are 1,649 acre-feet per year.

5.2.2.3 Alternatives 2, 3, and 4: Improve Off-Farm Efficiency, On-Farm Efficiency, and Control Brush and Weeds Along Canals and Drains

Alternatives 2 through 4 include improvements in agricultural and conveyance efficiency through: irrigation scheduling, metering, ditch lining or piping; on-farm laser leveling of fields and lining of ditches; and controlling brush and weeds along canals and drains. These changes, though they have the potential to significantly reduce required river diversions, reduce canal seepage, and reduce on-farm water requirements (see discussion in Appendix H, March 7 2003 memo), will have little impact on crop consumptive use, the variable modeled in the basin-wide probabilistic water budget model[2].

The combined proposed changes in alternatives 2, 3, and 4 have the potential to reduce evapotranspiration from vegetation along the canals and drains, incidental

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[2] The water budget model operates on the premise that water "lost" to canal seepage and on-farm seepage is returned to the surface water system; it either flows into the drains and is returned directly, or flows to the shallow-groundwater system, which is in effective hydraulic connection with the river/drain system (physical connection is present over sufficient reaches that this mass balance is preserved although local areas of disconnection may result in some lag time for returns to the stream system).

evaporative losses from puddles in non-laser leveled fields, and evaporation from the water surfaces in the canals and drains. In the analysis of the regional water budget, these are relatively small terms; the combined impacts of implementation of Alternatives 2, 3, and 4 are estimated at 5% of the SSPR agricultural consumptive use[3], or 2,768 acre-feet per year.

5.2.2.4 Alternative 5: Removal of Exotic Vegetation

Removal of exotic vegetation has the potential to result in either significant consumptive use reduction, little change in consumptive use, or possibly even consumptive use increase depending on how it is implemented.

If areas are carefully chosen such that, with the addition of drainage, the water table can be lowered and the area cease to be riparian habitat, then once vegetation is removed and drainage installed, the area will become scrub or grassland with little or no direct evaporative loss. In this case, the evaporative savings will be on the order of 4 acre-feet per acre, the average evapotranspiration loss from salt-cedar (King and Bawazir, 2000). This may be possible in areas such as the east side of the Rio Grande north of San Antonio where arroyos no longer connect to the river and instead serve only to water large areas of salt cedar. Reconnection of the arroyos to the river might reduce salt cedar habitat along the eastern margin of the currently vegetated area. Some property owners in this area appear to be working on reconnecting arroyos to the river – if this re-engineering is combined with salt cedar removal, the area could prove a valuable test ground for the potential for this course of action to reduce salt cedar areas.

If non-native vegetation is removed but the water table remains high enough to support riparian growth, re-vegetation with native riparian plants is required to avoid re-colonization by non-native species. Removing non-natives and re-vegetating with native plants may result in evaporative savings on the order of 1 acre-foot per acre, reflecting a change from salt-cedar, at a consumptive use of 4 acre-feet per acre, to native bosque, at 3 acre-feet per acre (King and Bawazir, 2000). If the area is not re-vegetated with native riparian species, either non-natives will re-colonize the area, resulting in no water

[3] Value based on the analysis presented in the memo of March 7, 2003, revised upward to take into account incidental depletions not previously quantified.

savings, or the water table may rise, resulting in saturated soils and standing water which evaporate at 5.6 acre-feet per year, thereby increasing consumptive use.

In analyzing this alternative, it is assumed that exotic vegetation removal in non-drainable areas will be accompanied by re-vegetation by native species. To adequately capture the potential variability in savings based on location of removal, and also to capture the possible range in acreage on which non-natives are eradicated, three options are evaluated:

- **Alternative 5A:** Removal of non-native vegetation from 4,060 acres (10% of the 40,598 riparian acres between the Socorro county line and the north end of Elephant Butte Reservoir at full capacity) in drainable areas, resulting in a decrease in consumptive use of 16,240 acre-feet per year (4 acre-feet per acre over 4,060 acres). It is assumed that the area can be drained sufficiently such that it will re-colonize only in native grasses and scrub, rather than riparian growth;
- **Alternative 5B:** Removal of non-native vegetation from 4,060 acres (10% of the riparian acreage between the Socorro county line and the north end of Elephant Butte Reservoir at full capacity), replaced with native vegetation, resulting in a decrease in consumptive use of 4,060 acre-feet per year (1 acre-foot per acre reduction in consumptive use);
- **Alternative 5C:** Removal of non-native vegetation from 20,300 acres (50% of the riparian acreage between the Socorro county line and the north end of Elephant Butte Reservoir at full capacity), replaced with native vegetation, resulting in a decrease in consumptive use of 20,300 acre-feet per year (1 acre-foot per acre reduction in consumptive use).

5.2.2.5 All Alternatives (1A, 1B, 2, 3, 4, and 5A/5B/5C)

A final evaluation, combining all five alternatives, is provided to look at the impacts of fully implementing all planning alternatives. Three versions of the full-implementation scenario, All Alternatives A, All Alternatives B, and All Alternatives C, are given corresponding to the three options for Alternative 5.

5.2.3 Modification of the Water Budget Model for Alternatives Analysis

The following changes were made to the water budget model to accommodate the SSPR alternatives:

1. All flows, water inputs, and consumptive uses were divided into above and below the Valencia/Socorro county line components;
2. Intermediate model calculations were made to quantify net inflow, regional demand, and net outflow for model sections above and below the county line;

3. Evapotranspiration losses for Elephant Butte Reservoir were recalculated to incorporate Alternative 1A, a new probability distribution was fit to the data, and the alternative distribution incorporated into the model.

These changes are described in more detail below.

The modeling done as part of the Middle Rio Grande Water Supply Study consists of two parts, the use of groundwater models other groundwater analyses to generate the base stream/aquifer exchanges and pumping-induced stream depletions; and, a probabilistic water budget model which integrates surface water inflows, groundwater effects, and consumptive use demands to determine regional Compact credit/debit. For the evaluation of the SSPR alternatives, changes were made only in the probabilistic model. None of the identified alternatives involve significant changes to groundwater conditions in the SSPR.

To provide the SSPR with inflow at the county line and consumptive use within the study area below the county line, agricultural, riparian, and open water consumptive use, effective precipitation, wastewater return flows, and tributary inflows were subdivided into above and below the Valencia/Socorro county line components. Groundwater inflow and pumping depletions obtained from the Albuquerque Basin model are assigned to the model section above the Socorro county line, to reflect the spatial distribution of the simulated pumping. Using the subdivided inflow and depletion terms, intermediate calculations were made to quantify net inflow, regional demand, and net outflow for the study area above and below the county line (Table 4.6). Inflow to the planning regions is “net” inflow, i.e., inflow minus water needed to satisfy the Compact Obligation and Elephant Butte Losses. Based on this convention, net outflow from the SSPR represents Compact credit/debit.

Within the probabilistic model, the agricultural, riparian, and open water consumptive uses, and the Elephant Butte losses required modification to represent implementation of the planning alternatives; all other terms remained as for the base case run. For Alternative 1A, a new probability distribution was prepared for the Elephant Butte Reservoir reflecting the revisions to the evapotranspiration losses in the north basin under implementation of the alternative. For Alternatives 1B and all three versions of Alternative 5 (A, B, and C), the changes imposed by implementation of the alternatives are to open water and riparian consumptive use. Since open water evaporation and riparian evapotranspiration are both included in the model as static values, no model run is required to evaluate these changes; evaluation of the alternative can be done by adjusting the SSPR demand and the resulting SSPR outflow by the acre-feet per year changes resulting from the alternatives.

For Alternatives 2, 3, and 4, implementation of the alternatives is modeled as a change in agricultural consumptive use. Agricultural consumptive use in the model is represented with a probability distribution to capture some variability due to climate-driven moisture conditions (in a wetter/cloudier season, the consumptive irrigation requirement will be lower than in a drier/hotter season). However, the combined impact of Alternatives 2, 3 and 4 are modeled as a static change. This was done for two reasons: a) the distribution used to represent agricultural consumptive use is very tight, with an average of 55,360 acre-feet per year and a standard deviation of less than 3000 acre-feet per year; and b) the average change in agricultural consumptive use resulting from implementation of the planning alternatives is 2,768 acre-feet per year. Given the nature of the agricultural consumptive use distribution and the size of the change in agricultural consumptive use resulting from implementation of the planning alternative, a modification to the algorithm of variability under the alternative would provide little benefit to the analyses.

5.2.4 Results of Quantitative Evaluation of Socorro-Sierra Planning Region Alternatives Analysis

As for the base-case scenario described in Chapter 4, the probabilistic model was run for 10,000 realizations. For each realization, water budget values were drawn from the probability distribution or otherwise specified values, for that term. Since Alternatives 1B, 2 through 4, and 5 were implemented as static changes, changes to the model were only required for Alternative 1A, and therefore only one model run was required to model the full suite of SSPR alternatives. Water budget results are presented for both the base-case and under the proposed SSPR alternatives. All flows terms are presented as net available water, with Compact deliveries and Elephant Butte Losses removed.

Table 5.1 shows the average, 10th percentile, and 90th percentile values calculated by the base case model for several water supply and demand terms, including adjusted inflow into each model section, depletions by model section, and outflow for the MRGPR and SSPR. The modeled distributions for these terms are shown in Figures 5.1 – 5.4.

Figure 5.2 shows the modeled outflow from model Section 1; this corresponds to the mainstem outflow from the MRGPR across the Valencia-Socorro county line. Flow is highly variable and ranges from –40,000 acre-feet per year to over 175,000 acre-feet per year. Negative flows in this context imply that depletions are exceeding available inflow at a given point. This may or may not result in a Compact debit, depending on the tributary inflows and depletions in the areas downstream of a given point. As can be seen, calculated (available) flows are negative below the 20th percentile at the Valencia-Socorro county line. Whether or not such a condition would result in a Compact debit is dependent on downstream inflows, and on how depletions are managed in both planning regions during a condition of low supply. Approaches to demand reduction or supply augmentation in times of drought are undergoing evaluation as part of the regional and state water planning process.

Figure 5.3 shows the modeled base case inflow to, and depletions for, model sections 2 and 3. As noted above, the depletions from the Elephant Butte Reservoir have been removed as a first step in this analysis, to isolate the available supply for alternatives analysis. Therefore, depletions shown in Figure 5.3 reflect only the crop, riparian and non-reservoir open water losses within Section 2 and 3. Inflow is highly variable, due both to the high variability in the Section 1 outflow, as well as high variability in inflow from Section 2 and 3 tributaries (Figure 4.20), while the depletions are nearly constant, varying only with the agricultural consumptive use. Inflow ranges from less than 37,000 acre-feet per year to over 335,000 acre-feet per year; depletions are about 250,000 acre-feet per year. In the current model simulation, demand is met only at the 75th percentile and above. Negative outflows from model Section 3 (Figure 5.4), corresponding to Compact debit conditions, occur at the 75th percentile and below.

The impacts of the proposed SSPR planning alternatives are shown in Table 5.3 and in Figures 5.5-5.7. The mean changes, by alternative, in model Sections 2 and 3 depletions resulting from implementation of the SSPR planning alternatives are given in Table 5.3. Since all but Alternative 1A represent static changes, no distributions are required for these terms to illustrate the range of possible outcomes. The range of impacts resulting from Alternative 1A is shown in Figure 5.5 (Table 4.6 provides maximum, minimum, standard deviation, and percentile values for this change in Elephant Butte Losses). Alternative 1A results in a mean reduction in depletions of 11,855 acre-feet per year. However, this reduction is greater when Elephant Butte losses are small (when the reservoir is at low levels, generally during dry periods), and smaller when Elephant Butte losses are large (during high reservoir levels, generally during wet periods).

The impact of full implementation of All Alternatives C on Section 2 and 3 depletions is shown in Figure 5.6. Demand is reduced at all percentiles; the reduction in demand is greater at the 5th percentile (41,200 acre-foot reduction in demand) than at the 95th percentile (30,100 acre-foot reduction in demand), resulting from the variation in reduction seen with Alternative 1A. Under full implementation of All Alternatives C, regional demand is now met at the 60th percentile and above. This can also be seen in the change in distribution of Section 3 outflow (Figure 5.7).

The point at which supply meets demand should be considered a relative, rather than absolute, measure. This model run does not take into account reduction in consumptive water use during droughts other than the reduction in Elephant Butte losses. In reality, shortages in supply would probably be shared equally between agricultural entities in the Middle Rio Grande Basin, thereby effectively increasing the Sections 2 and 3 inflow. The model currently fully satisfies the MRGPR and SSPR demand, regardless of inflow, by dipping into Compact delivery water and accruing a Compact debit for that year. The supply-meets-demand point, however, is useful as a relative tool to look at how changes in supply resulting from implementation of planning alternatives will affect the ability to meet demand. The modeled shift from the 75th to the 60th percentile in meeting demand is indicative of a shift in the ability of the region to satisfy demand during drier periods.

5.3 Combined MRGPR and SSPR Alternatives

Figure 5.1
Modeled Base Case Section 1 Inflow and Depletions

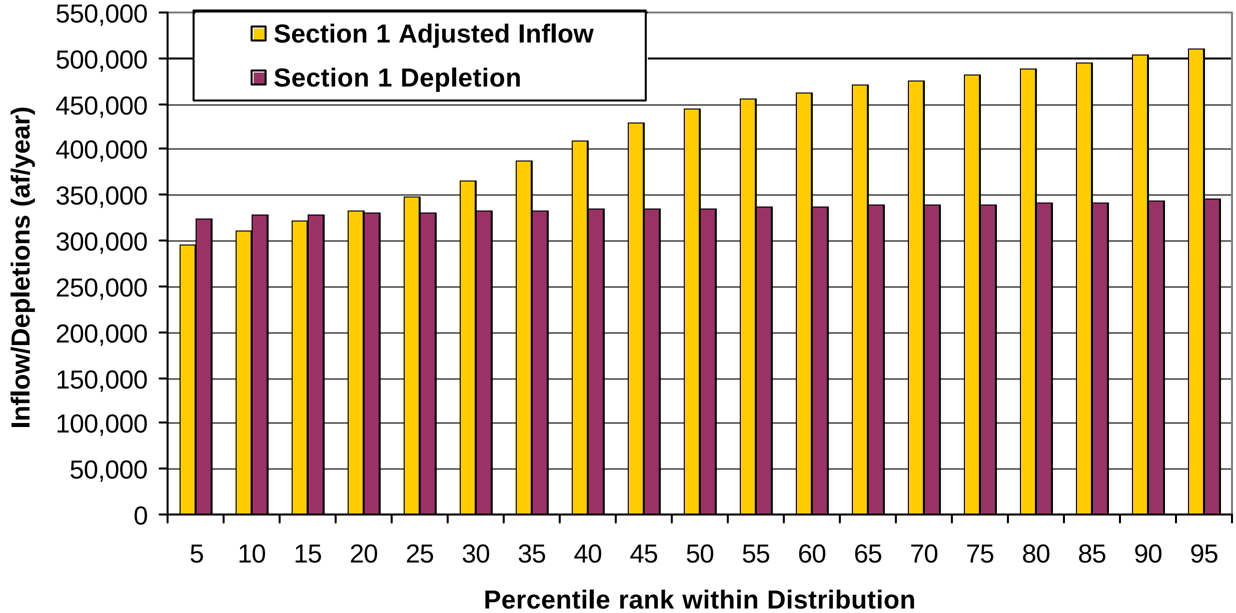

Figure 5.2
Modeled Base Case Section 1 Outflow

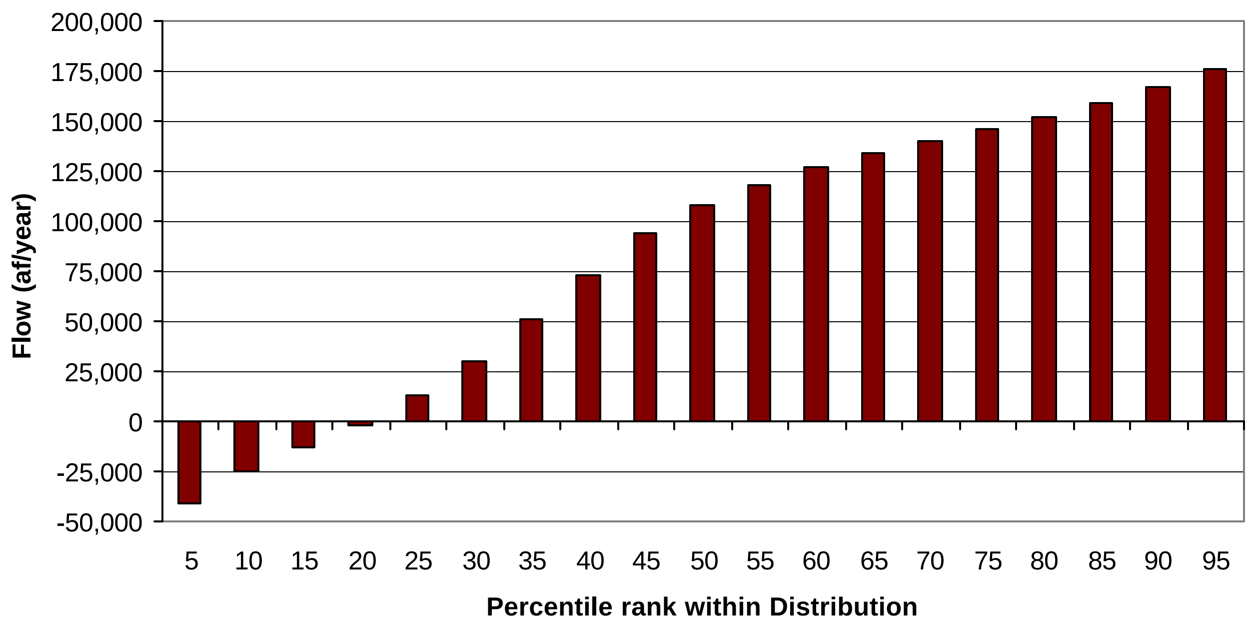

Figure 5.3
Modeled Base Case Sections 2 and 3 Inflow and Depletions

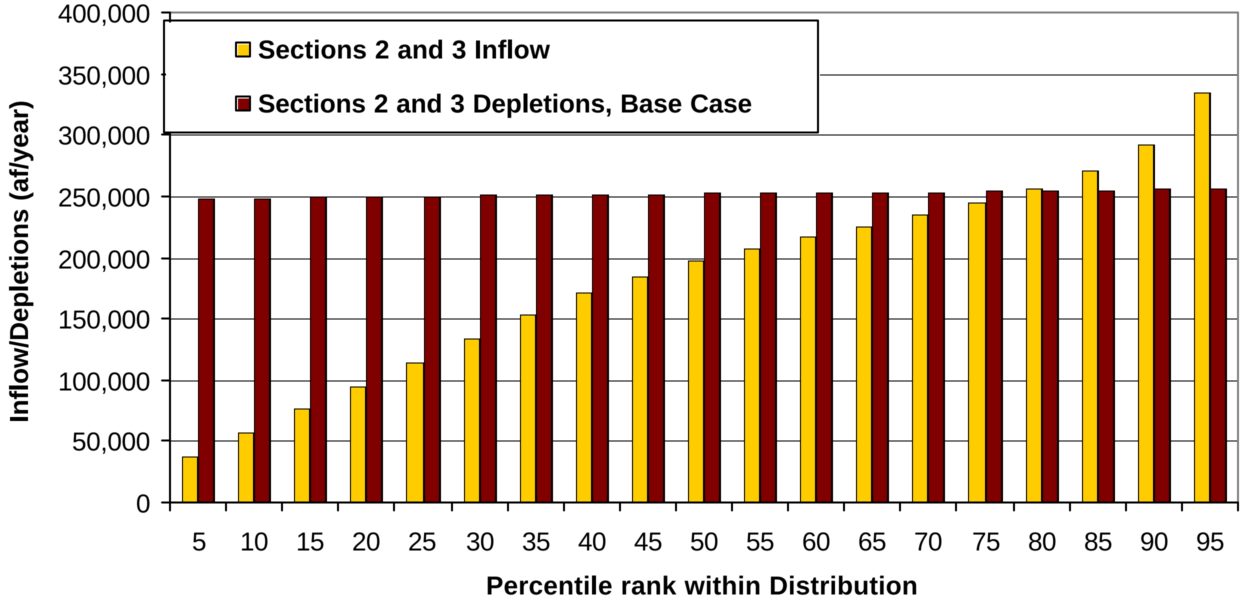

Figure 5.4
Modeled Base Case Section 3 Outflow

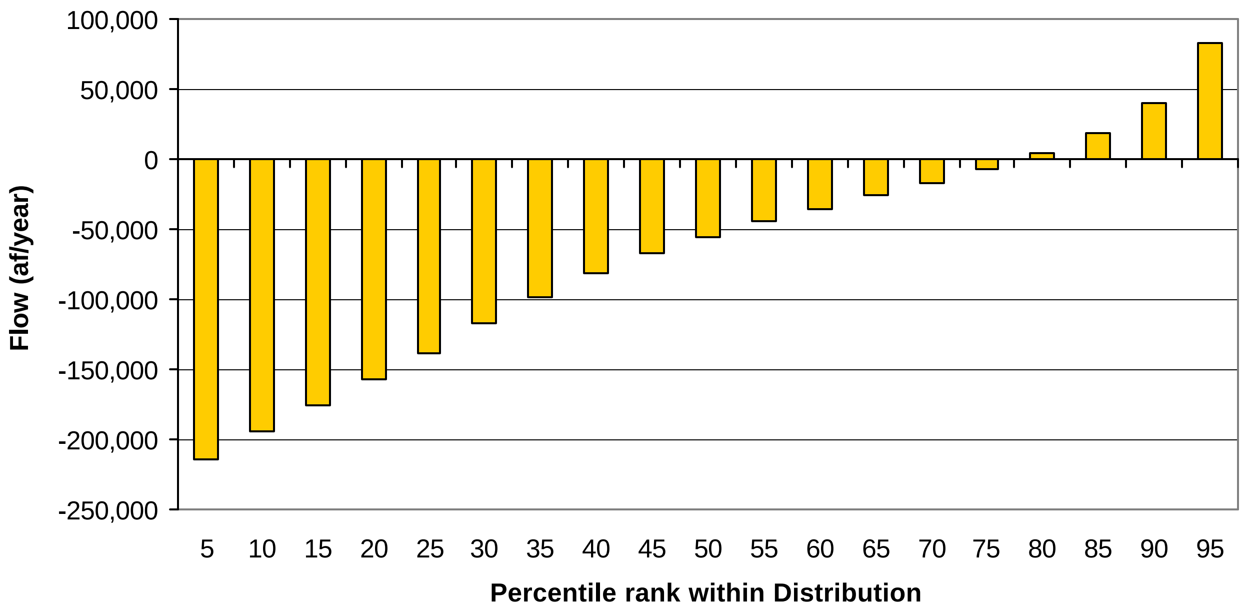

Figure 5.5
Modeled Elephant Butte Losses for the Base Case and Under SSPR Alternative 1A

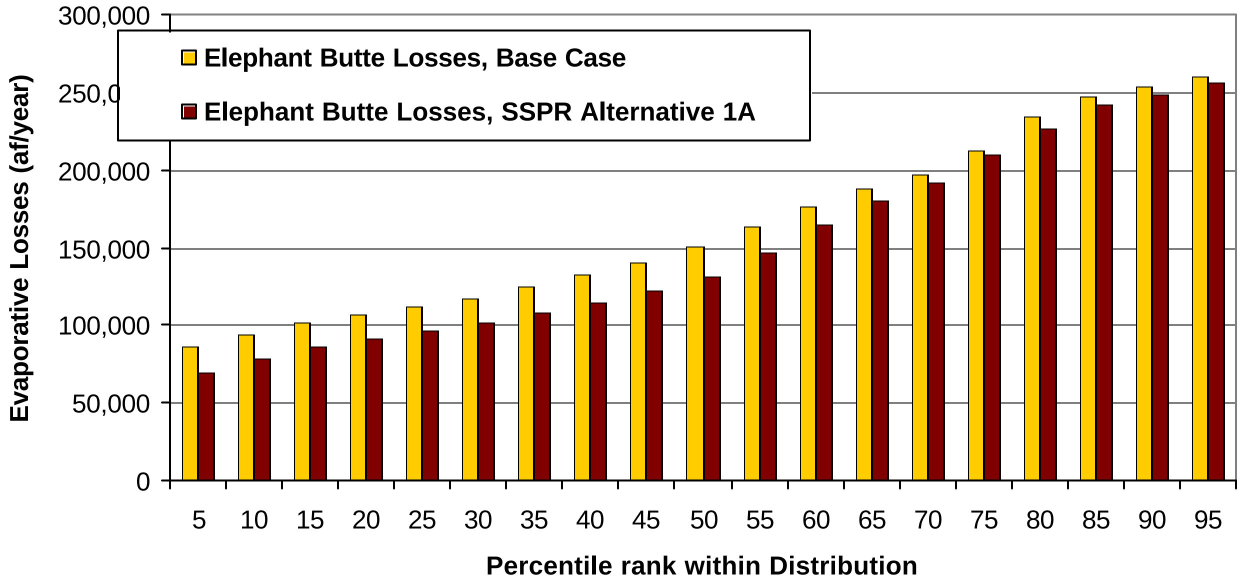

Figure 5.6
Modeled Base Case Inflow, and Depletions for the Base Case and Under SSPR All Alternatives C

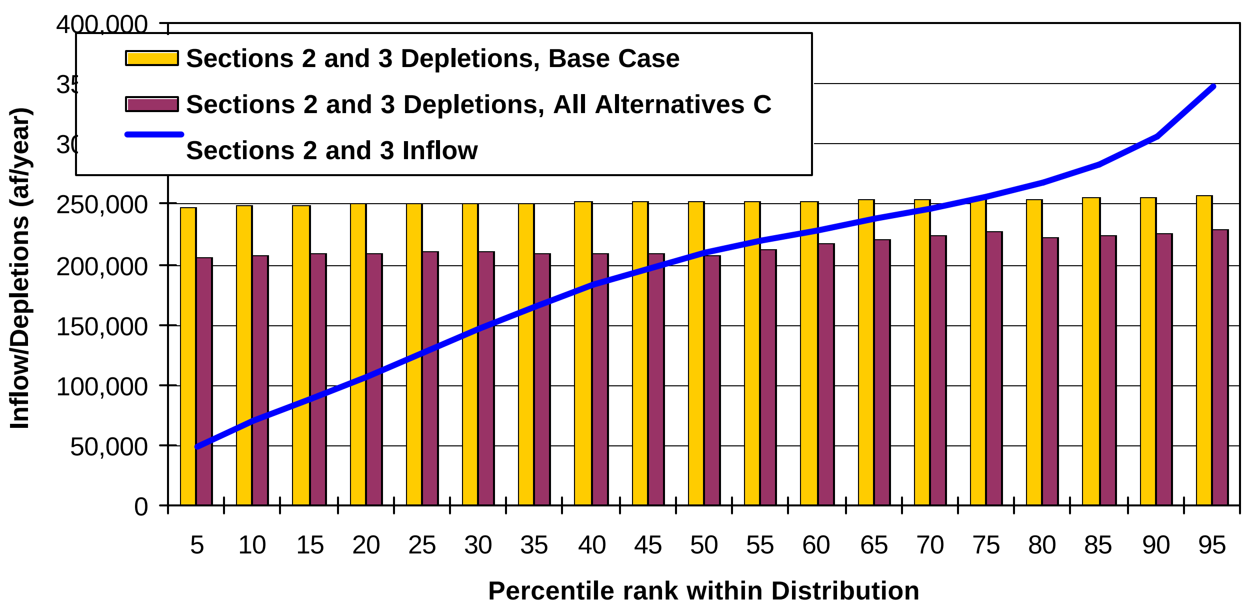

Figure 5.7
Modeled Section 3 Outflow for the Base Case and Under SSPR All Alternatives C

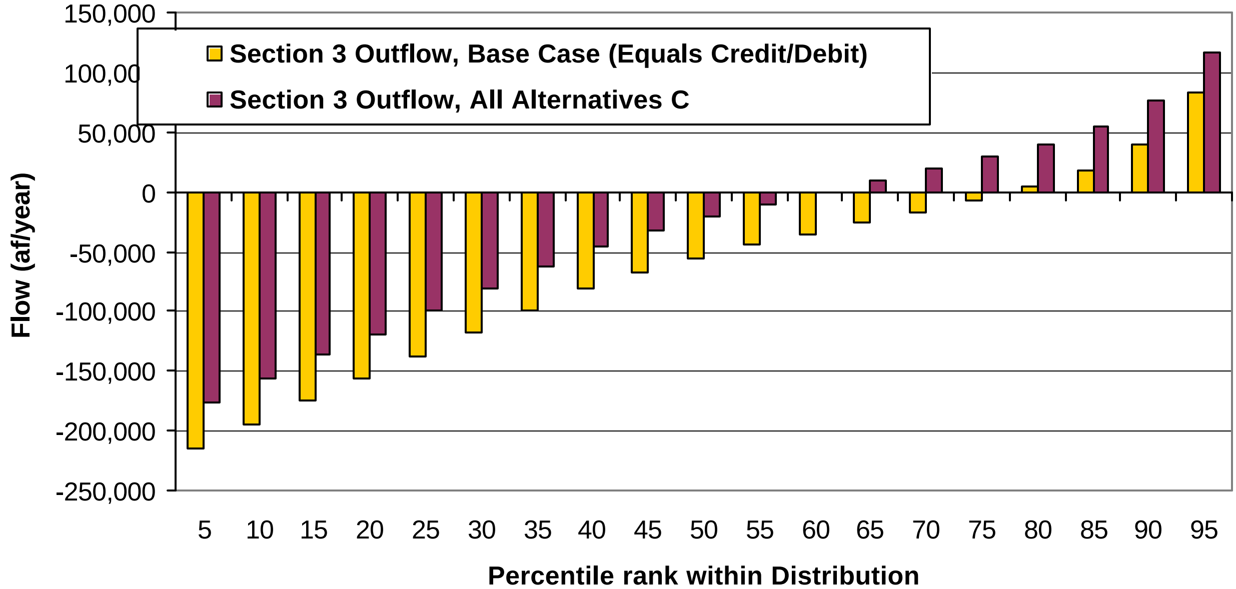

Table 5.1

Average, 10th and 90th percentile model values for inflow and depletion terms

Flow Term	10th percentile flows (af/year), 10,000 model realizations*	Average flow (af/year), 10,000 model realizations*	90th percentile flows (af/year), 10,000 model realizations*
Otowi Index Supply inflow at Otowi	335,512	930,084	1,679,158
Obligation	191,242	624,104	1,274,158
Total Inflow (Cochiti to Elephant Butte) - Obligation	510,440	687,070	835,774
Elephant Butte Losses	94,012	163,577	253,611
Adjusted Model Section 1 inflow**	312,133	419,867	502,914
Model Section 1 Depletion	327,841	336,089	344,401
Agricultural consumptive use, section 1	-121,927	-130,048	-138,274
Riparian consumptive use, section 1	-89,032	-89,032	-89,032
Open water Consumptive use, section 1	-28,106	-28,106	-28,106
Surface water depletions from groundwater pumping	-79,600	-79,600	-79,600
MRGPR Outflow = Adjusted SSPR mainstem inflow**	-24,858	83,779	167,212
Adjusted SSPR Total Inflow**	57,597	187,405	293,032
Rio Puerco inflow	7,466	25,645	51,197
Rio Salado inflow	1,508	10,393	23,032
Ungaged tributaries, westside	2,511	17,090	38,534
Ungaged tributaries, eastside section 2	935	6,381	14,322
Ungaged tributaries, eastside section 3	675	4,602	10,331
Wastewater inflow	966	966	966
Effective precipitation	22,050	22,050	22,050
Groundwater inflow	16,500	16,500	16,500
SSPR depletion	248,825	252,306	255,831
Agricultural consumptive use, section 2	-15,676	-16,720	-17,778
Agricultural consumptive use, section 3	-36,578	-39,014	-41,482
Riparian consumptive use, section 2	-44,829	-44,829	-44,829
Riparian consumptive use, section 3	-112,792	-112,792	-112,792
Open water Consumptive use, section 2	-7,787	-7,787	-7,787
Open water Consumptive use, section 3	-27,863	-27,863	-27,863
Surface water depletions from groundwater pumping	-3,300	-3,300	-3,300
SSPR outflow = NM Delivery Credit/Debit	-194,420	-64,901	40,230

* Base case model run - no regional planning alternatives included.
** Compact Obligation and Elephant Butte Losses removed. Also, the identified SSPR inflow and depletion terms are limited to those occurring within the Study Area.

Table 5.2

Middle Rio Grande Planning Region proposed planning alternatives

Alternative	Agricultural CU Change (af/year)	Riparian CU Change (af/year)	Open Water CU Change (af/year)	Municipal CU Change (af/year)	Reduction in Regional demand (af/year)
					0
					0
					0
					0
Planning alternatives not yet received from Middle Rio Grande Planning Region					0
					0
					0
					0
					0
					0

* Average reduction in agricultural, riparian, open water and municipal consumptive use as a function of each alternative.

Table 5.3

Socorro-Sierra Planning Region proposed planning alternatives

Alternative	Agricultural CU Change (af/year)	Riparian CU Change (af/year)	Open Water CU Change (af/year)	Change in Elephant Butte Losses (af/year)	Reduction in Regional demand (af/year)
Alternative 1A				-11,855	11,855
Alternative 1B			-1,649		1,649
Alternatives 2, 3, and 4	-2,768				2,768
Alternative 5A		-16,240			16,240
Alternative 5B		-4,060			4,060
Alternative 5C		-20,300			20,300
All Alternatives A	-2,768	-16,240	-1,649	-11,855	32,512
All Alternatives B	-2,768	-4,060	-1,649	-11,855	20,332
All Alternatives C	-2,768	-20,300	-1,649	-11,855	36,572

* Average reduction in agricultural, riparian, and open water consumptive use as a function of each alternative.

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Memorandum

Date: March 7, 2003

From: Karen Lewis, Debbie Hathaway

To: Socorro-Sierra Regional Water Planning Group

Subject: **Selected Planning Alternatives –Analysis of Hydrologic Impacts**

Background

The Socorro-Sierra Regional Water Planning group has developed a short-list of water planning alternatives. By letter of January 24, 2003, the Socorro Soil & Water Conservation District requested that the ISC authorize SSP&A to provide a hydrologic analysis of these chosen alternatives. By letter of January 30, 2003, the ISC authorized SSP&A to analyze the noted alternatives (as part of work for the Middle Rio Grande Water Supply Study, Phase 3). This analysis includes:

- Quantitative estimates of changes in water consumption and qualitative estimates of changes in diversions resulting from implementation of the proposed alternatives
- An evaluation of sensitivities and relationships between alternatives and between alternatives and other model parameters, with attention paid to how these sensitivities and relationships will impact water consumption, availability, and, to limited extent, to timing of deliveries and diversions. Required modifications to the MRG WSS models resulting from these sensitivities and relationships will be outlined.
- Modification of the MRG WSS Phase 2 models to reflect the proposed alternatives and their sensitivities and relationships. Results will be provided in the context of regional water supply and impact on Compact obligations.
- A quantitative evaluation of surface water flow into the Socorro-Sierra region north of Elephant Butte Dam. This quantification will be based on the MRG WSS Phase 2 model, modified to provide a regional break at the county line such that all flows at and below that point can be evaluated. The evaluation will be presented in a probabilistic format.
- Riparian and agricultural consumptive use and open water evaporation for the Socorro-Sierra region north of Elephant Butte Dam, including evaporation for Elephant Butte reservoir, based on the information and data currently contained in the MRG WSS Phase 2 model.

This memorandum addresses the first bullet above, or, Task 1 described in the letter of January 30. The list of alternatives submitted to SSP&A for evaluation is provided below. Following the list is a quantitative evaluation of the hydrologic impacts of each item on the list, as well as a qualitative estimate of the changes in diversions that would result from implementation of each proposed alternative.

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Socorro-Sierra Short-List Alternatives Identified for SSP&A Review

Socorro/Sierra has chosen 16 alternatives that they are pursuing in greater detail. Of these, six alternatives have been identified for hydrologic analysis by SSPA (1e, 3e, 3i, 4b, 4d, and 7b) and one was identified for comment (1d). The seven alternatives are:

1. 1e - Evaporation control through reduced water surface areas in engineered and natural areas
2. 3e - Improve efficiency of surface water conveyance systems to agricultural land, including irrigation scheduling, metering, and ditch lining or piping.
3. 3i - Improve on-farm efficiency
4. 4b - Control brush and weeds along water distribution systems and drains
5. 4d - Remove exotic vegetation (i.e. Salt cedar, Russian olive) on wide scale
6. 7b - Encourage retention of water within the planning region
7. 1d - Move water to higher elevation

Discussion of Hydrologic Impacts

The hydrologic impacts of these alternatives are reviewed at a detailed level. The goal of this review is to quantify changes to water consumption resulting from implementation of the alternative. Table 1 provides a quantitative water savings for each alternative, focusing on the opportunity to save (or gain) water from a consumptive perspective, and a qualitative assessment of changes in diversions; while changes in diversions without commensurate consumptive changes typically don't impact the basin supply (or ability to meet Compact obligations), there may be benefits to modifying diversions at a regional or local level, particularly when considering cost and environmental issues. Where possible, comments are offered in the text on technical, economic and political feasibility.

This memo is intended to provide regional planners with an assessment of hydrologic costs and benefits of each of the chosen alternative to the best of our current knowledge, and to aid planners in further refining their chosen alternatives to maximize the efficiency and success of the water planning process in the region.

For purposes of this analysis, we have used agricultural data for the Socorro Division of the MRGCD and riparian data from ET Toolbox reaches 5, 6 and 7. The Socorro-Sierra region, however, extends further north than either of these boundaries. Consequently, agricultural estimates are low; roughly 20% of the Belen division is contained within Socorro County, i.e. approximately 6,400 additional irrigated acres and 64 miles of canals. The crop acreage within the Socorro-Sierra County planning region, outside of the Socorro Division, will be estimated from GIS coverages as part of Task 3. Riparian values used in the calculations will be similarly adjusted in Task 3. However, the adjustment will not be as significant as that for crop acreage, because the bulk of the Middle Rio Grande mono-typical salt-cedar stands lie below Bernardo.

1 Evaporation control through reduced water surface areas in engineered and natural areas

Reduction of water surface areas, such as a reduction in the wetted area of the Elephant Butte delta and reduction of ponded areas between San Marcial and the reservoir, is important for efficient delivery of water to Elephant Butte Reservoir for meeting obligations under the Rio Grande Compact. Under current conditions, the open water and swamp portions in the delta are significant and result in high evaporative losses. There are also many open water areas in state and federal wildlife and game refuges within the Socorro-Sierra region. Reduction in these open water areas could also reduce water lost to evaporation. An analysis of the reduction in water depletion through evaporation available through implementation of this alternative is presented for two conditions:

A. Reducing evapotranspiration and evaporation from the Elephant Butte delta through channel construction and maintenance
B. Reducing open water areas within the counties' wildlife and game refuges

Reducing evapotranspiration and evaporation from the Elephant Butte delta

The LFCC provides drainage in the region from San Acacia to the delta, and was designed to improve the delivery of diverted river water and intercepted drainage water to the reservoir. Currently, the lower part of the LFCC through the delta area is not functioning as designed due to siltation and channel breaches. As a result, the water carried in the LFCC is deposited in marshy areas in the delta. Additionally, water in the river channel, whose bed elevation has significantly aggraded over past decades, spreads into the delta area, with much of it contributing to ponded or marshy areas. Field studies to support the characterization of the water budget in the delta area have not been conducted, but the following general statements can be made:

- Water from the LFCC and the river spread across the delta area. The disposition of these waters includes: seepage into the subsurface, open water evaporation, evapotranspiration by riparian vegetation, and surface flow to the reservoir through a network of smaller channels;
- Water in the shallow subsurface of the delta area has the following disposition, with relative quantities unknown: evaporation from wetted soils, riparian evapotranspiration, subsurface flow to the reservoir, interception by portions of the LFCC in places where the LFCC water surface lies below the shallow groundwater elevation.

A pilot channel is currently under construction to reconnect the river to the reservoir. This channel also intercepts a main area of spreading LFCC drainage in its planned downstream reach. The lower portion of the channel is on schedule for completion at the end of April 2003. The upper portion of the channel is partially complete, but the schedule for full completion is unclear. The intent of these channel maintenance activities is to provide a channel that can effectively carry spring run-off to the reservoir, thus, avoiding the spreading of floodwaters into the delta area. If these activities are successful, the delivery of water will return to what might be considered a "baseline condition", akin to what existed prior to the flooding and high waters that occurred in the 1980's. At present, the depth of the channel has not been designed to drain subsurface water to an elevation beyond the reach of riparian vegetation.

In evaluating this alternative, three scenarios are defined:

1) Failed or no maintenance: Conditions as in the past decade. Water from the LFCC and the river spread across the delta and extensive ponding occurs.
2) Successful pilot channel, effective maintenance of channel: Conditions returned to those as occurred prior to channel siltation in the 1980s; however, potential exists for significant riparian re-colonization during pool recession.
3) Deepening of the channel to increase drainage of saturated sediments in the delta and upper reservoir area. Consequent reduction in potential for riparian re-colonization.

For each scenario, it is assumed that the reservoir level is below the Narrows. The potential for reduction in water depletion under each scenario is discussed below and is roughly quantified. Table 1 summarizes the estimated reduction in depletion.

1) *Failed or no maintenance*. Under this scenario, open water evaporation occurs at essentially the same rate as would occur with a full reservoir throughout the delta area and the (drained) upper reservoir area. No savings occur. Water depletion under a less-than-full reservoir will exceed that which occurred prior to the 1980s.
2) *Successful pilot channel, effective maintenance of channel:* Under this scenario, water depletions return to what some would term a "baseline condition" of normal operation. Water savings occur in two ways. First, spring run-off is routed quickly to the reservoir, rather than being held up through ponding, following a tortuous path through marshy areas and generally being subject to greater evaporation losses. Secondly, many ponded or marshy areas will dry, reducing open water evaporation. However, under this scenario, the groundwater elevation will likely still be within the reach of riparian vegetation. If colonization has been allowed to occur during recession, then evapotranspiration over a large area, potentially as large as the area previously covered by marshy conditions, may occur. The estimated (minimum) difference in water depletion between this scenario and scenario #1 is equal to the difference between open water evaporation and riparian evapotranspiration rates. Estimating annual average open water evaporation at 7 acre-feet per acre, and riparian evapotranspiration at 4 acre-feet per acre, this difference amounts to approximately 3 acre-feet per acre over the affected area. We don't have available data on the relative amounts of open water versus riparian vegetation in this area at present; nor do we have projections on how this will change upon completion of the pilot channel. The assumptions below should be refined if this analysis is critical in the decision making process. If we assume that presently, one half of the approximately 14,700 acres of the northern basin of Elephant Butte Reservoir, is characterized as marshy or ponded, and the other half consists of riparian area (50% marsh, 50% riparian as in scenario 1); and if the completion of the channel results in conversion of 75% of the open water area to riparian (scenario 2a, 12.5% marsh, 87.5% riparian), then, water depletion under this scenario is reduced by difference would amount to approximately 16,500 acre-feet per year. *It should be understood that this reduction in depletion from today's condition does not*

represent salvage or new water. In reality, this effort reduces excessive depletion that occurred due to the lack of effective channel maintenance over the past 18 years.

3) *Deepening of the channel to increase drainage of saturated sediments in the delta and upper reservoir area*: If the channel is deepened to drain surrounding delta and upper pool areas to the extent that it becomes difficult for riparian vegetation to colonize in areas exposed by reservoir recession, reduction in water depletion beyond the "baseline" level would result. The reduction would be equal to the difference between riparian evapotranspiration and bare ground evaporation (estimated at 1 acre-foot per acre for this calculation) in areas where depth to shallow ground water was adequately increased. Without field study of this area, it is not possible to know how deep channel excavation would need to be to accomplish adequate water table lowering nor is it possible to assess the feasibility. However, to enable discussion, we provide an estimate of hypothetical depletion reduction by assuming that riparian evapotranspiration would be limited to 50% of the exposed area, and drained ground will constitute the remaining 50% of the exposed area under the lowered water table scenario. Under these assumptions (scenario 3a), the change in water depletion, as compared to scenario 2a (87.5% riparian, 12.5% marsh), would be 22,050 acre-feet per year; or, as compared to scenario 1 (assumed present condition) would be 38,5990 acre-feet per year. This scenario, involving maintenance of drainage conditions (and reduction of marshy areas), may be problematic if Southwest Willow Flycatcher habitat develops in areas of the receding reservoir.

Table 1: Hypothetical evapotranspirative water use in the Elephant Butte northern basin under various scenarios.

Elephant Butte northern basin hypothetical evaporation/evapotranspiration (total area assumed is 14,700 acre-feet)				
	Marsh area (7 ac-ft/ac)	Riparian area (4 ac-ft/ac)	Barren area (1 ac-ft/ac)	Total ET (acre-feet)
Scenario 1	50%	50%		80,850
Scenario 2a	12.5%	87.5%		64,310
Scenario 2b		100%		58,800
Scenario 3a		50%	50%	42,260
Scenario 3b		20%	80%	23,520

<u>Reducing open water areas within the counties' wildlife and game refuges</u>

Open water evaporation from exposed open water bodies generally exceeds riparian evapotranspiration. Evaporation for small ponds shaded by trees and other growth, such as backwaters being constructed along the river for Silvery Minnow habitat, may have evaporation rates equal to or smaller than that of riparian vegetation.

Reduction in surface areas of these larger ponds could, therefore, result in reduced depletion for the region. Open water evaporation from Elephant Butte Reservoir is 7 feet per year; average open water evaporation for the San Acacia to San Marcial reach, as modeled in the ET Toolbox, is about 5.6 feet per year. Compared to evaporation rates of 4 feet per year for salt cedar and 3 feet per year for cottonwood, anywhere from 1.6 to 4 acre-feet of water per acre per year could potentially be saved by converting larger ponds to bosque.

A current number for acres of ponded areas between San Acacia and the Elephant Butte delta is unavailable. The ET Toolbox acreage for open water between Bernardo and the Elephant Butte Delta is 5,490 acres, this includes ponds, canals, drains, and river channel areas. For discussion purposes only, a rough estimate of hypothetical reduction in depletion follows. Further work is required to realistically assess these reductions via implementation of this option:

- Assume 30% of the open water acreage is stand-alone ponds (1,650 acres)
- Assume 20% of these could be replaced with native bosque (330 acres)
- The reduction in depletion would therefore range from 525 to 1,320 acre-feet per year.

The value of these areas to habitat and the ecosystem would need to be considered carefully if this option is pursued. This evaluation has not assessed the habitat value, but understands that many in this region favor the benefits provided by these open water areas. Furthermore, many, perhaps most, of these stand-alone ponds lie within state and federal wildlife and game refuges, and this issue is beyond the region's direct control.

2 Improve efficiency of surface water conveyance systems to agricultural land by implementing conveyance alternatives (e.g. concrete-lined ditches, pipelines), improving irrigation scheduling, and metering and managing surface water diversions and returns

Potentially large reductions in agricultural diversion demand are possible through improvements in irrigation efficiency. Irrigation-related consumptive use reductions will be minimal (only ensuing from reductions in incidental depletions associated with efficiency improvements). Reductions in diversion demand resulting from these changes would allow water to be retained in upstream storage reservoirs longer and provide timing advantages for irrigation (or ancillary needs/benefits). Reductions in consumptive use will both reduce the diversion demand and "save" water.

"Saved" water will not likely be directly available to the planning region; however, improvements to MRGCD efficiency will improve the ability of the MRGCD to provide a full supply to all irrigators, including those in this region. Because the basis of the MRGCD's permitted water right is irrigated agriculture, any water not needed for this purpose due to conservation efforts is assumed to belong "to the public and is subject to appropriation for beneficial use" (New Mexico statutes, 1978, 72-1-1). In the Rio Grande Basin, which is considered by the State Engineer to be fully appropriated, these waters would satisfy other established water rights (which may be subject to shortage), subject to the constraints of the Rio Grande Compact. In other words, these savings, while not likely available for transfer to a specific use within the region, avoid what could be construed as waste, and would benefit the entire region by more efficiently using the available water supply.

Canal Lining/Piping

Canal lining will result in a reduction in seepage losses from the canals, thereby requiring smaller diversions to convey water to farms than under present conditions. Canal lining will also result in a reduction in riparian growth along the canals, and a commesurate reduction in evapotranspirative consumptive use.

Lining all of the canals in the region would be expensive, and probably unnecessary; it is likely that the majority of canal seepage comes from a minority of the canals. For this analysis, we have chosen to look at lining 20% of the canals. This is a placeholder value. Results can be scaled for other percentages.

The reduction in canal seepage is:

- 133.9 miles of canals in the Socorro divisions (obtained from project GIS coverages and reported in the MRGCD Efficiency Study, Table I-1), multiplied by 1.5 to take into account small canals and laterals not counted in the original survey
- 2001 division supply of 138,713 acre-feet of water
- canal seepage of 20 percent of canal flow (USBR Estimate) equals 27,743 acre-feet of water
- assume lining canals reduces seepage by 80%
- resulting reduction in the diversion requirement is 4,440 acre-feet/year. If the leakiest canals were located and lined, this value might be increased.

We note that this reduction in seepage might result in effectively "new" water if the seepage is currently returning to the LFCC and is subsequently lost to evaporation in the delta – see item 1, Evaporation control.

The decrease in riparian consumption, based on the same lining of 20% of the canals, is:

- 133.9 miles of canals in the Socorro divisions (MRGCD Efficiency Study, Table I-1), multiplied by 1.5 to take into account small canals and laterals not counted in the original mileage survey
- Assume 20' riparian corridor (10' on either side of the canals)
- Assume 2' annual ET from existing riparian growth (based on the average annual ET of salt grass – USBR report, Determination of Soil Conservation Service Modified Blaney-Criddle Crop Coefficients in New Mexico, 1997), and an eradication of that corridor by lining the canal.
- Water savings will be approximately 195 acre-feet per year from reduced riparian usage.

Additionally, there may be canals/laterals or sections of canals/laterals in the division that could be abandoned. Abandoning canals will reduce seepage and ET losses to near 0 for that stretch.

<u>Irrigation scheduling/metering and managing deliveries and river diversions and returns</u>

All of these options have the potential to significantly reduce required irrigation diversions. These options may result in reductions in consumptive use, but consumptive use changes are primarily incidental.

River diversions and returns are now metered in the Socorro Division of the MRGCD with the exception of the LFCC and the river as they exit the division. Much of this metering is relatively new, and over the next few years will allow the region to better understand irrigational water diversions and consumptions, which in turn will aid in planning and provide insight into potential areas where water can be saved or conserved. Estimates of both potential changes in consumptive use and reduced diversion demands as a result of this metering are unavailable at this time. Gaging the LFCC would further improve knowledge of regional water allocation. Currently, the LFCC is only gaged at San Marcial.

Rotational water delivery would reduce required diversions by reducing the amount of time canals must be run full. However, no data is currently available to quantify the improvement in off-farm efficiency resulting from rotational delivery. We note that rotational delivery is already practiced in some areas in the Socorro Division at some times.

Metering farm deliveries would reduce on-farm demand, and therefore reduce diversion requirements. Metering has been found to increase farmer's efficiency with water by 10 to 20% in other irrigation districts (Fipps, *Potential Water Savings in Irrigated Agriculture for the Rio Grande Planning Region, Final Report*, Texas A&M University System, 2000). If the water required at the farm turnouts is reduced by 10 to 20%, required diversions are reduced by a minimum of 10 to 20% (for 2001, this would have meant a potential reduction in division diversions of 13,870 to 27,740 acre-feet). Depending on how the conveyance system is run in response to reduced on-farm demand, conveyance losses could also be reduced, further reducing diversion requirements.

3 Improve on-farm irrigation efficiency

Improvements in on-farm efficiency reduce diversion through the farm turnout primarily by reducing runoff and percolation to the aquifer. Smaller reductions are also effected through reducing ponding. Of these, only the smaller reductions (by reducing ponding) represent changes in consumptive use. Any other changes will impact required diversions only. As for prior alternatives, improvements to irrigation efficiency will improve MRGCD supply, and potentially increase water available for use in the Middle Valley at large, but may not make new water available for the region.

Most of the Socorro Division of the MRGCD is devoted to production farms, where laser-leveling and concrete lining of the on-farm ditches has already been done. Anecdotal evidence suggests that these improvements can reduce on-farm efficiency by 30%, and reduce turnout time to 25% of that previously required to irrigate the same acreage. This, in turn, reduces required diversions, makes rotational delivery far more efficient, and allows for increased off-farm efficiency.

Though many of the big production farms in the Socorro Division have already made efficiency improvements, some percentage of the district's irrigated lands remain unimproved. Focusing on improving these lands will boost district on-farm efficiency and allow for effective rotational delivery to these lands, further improving off-farm efficiency.

Laser-leveling can increase on-farm efficiency by about 30% (Darryl Reasnor, NRCS, personal communication). If we assume 30% of the Socorro Division is currently unimproved, we could then improve efficiency by 30% on 30% of the lands, or improve district on-farm efficiency by 9%. This, in turn, will allow for a minimum of a 9% reduction in required diversions. For 2001, this would have allowed for a reduction in diversions of about 12,500 acre-feet of water.

With the exception of laser leveling fields and improving on-farm ditches, any improvements to on-farm efficiency would likely be costly in relation to their potential to reduce diversions, and very costly in relation to their potential to reduce consumptive use.

4 Control brush and weeds along water distribution system and drains

Currently, the MRGCD is mowing 100% of the canals and drains in the Socorro Division. Canals are mowed at least 2 to 3 times per year, and drains at least once per year. Complete eradication of vegetation along the canals and ditches would result in bank destabilization – plant roots currently provide bank support. Consequently, a balance needs to be maintained between controlling growth via mowing and maintaining adequate root mass to stabilize the canal and ditch banks. The primary vegetation along the canals and drains is weeds and grasses (johnny grass, kosha weed, mustard weed, some noxious weeds) with the occasional patch of willow. (This information was obtained from Johnny Mounyo in the Socorro Division MRGCD office.)

Water usage by weeds and grasses is likely 2 feet per year or less (salt grass uses about 2 feet per year). Some water savings might be achieved by increasing the number of mowings, but it is likely to be small. Currently, the data doesn't exist that would allow us to quantify the potential savings from increased mowing frequency.

5 Remove exotic vegetation on a wide-scale

The ET Toolbox, version of January 2003, reports riparian acreage between Bernardo and San Acacia as 6,600 acres, between San Acacia and San Marcial as 16,200 acres, and between San Marcial and Elephant Butte as 7,600 acres (30,400 acres total). (Note: This version updates the ET Toolbox acreage reported in the August 2000 MRGWSS study of 31,934 acres).

Average consumptive use from 1985 to 1998 was estimated at 3.71 acre-feet per acre for San Acacia to San Marcia (ET Toolbox value). Applying this to the entire stretch from Bernardo to Elephant Butte, the resulting riparian usage is 112,784 acre-feet per year. Studies of riparian evapotranspiration currently suggest that an established bosque uses about 3 acre-feet per acre per year of water (King and Bawazir, *Riparian Evapotranspiration Studies of the Middle Rio Grande*, 2000). Based on these values, if salt cedar were removed and replaced with native bosque, the potential reduced depletion is 0.71 acre-feet per acre. Since most of the riparian acreage between San Acacia and the Elephant Butte delta is dominated by salt cedar, this potential reduced depletion can conceivably be applied to the total riparian acreage, resulting in a total reduced depletion of 21,584 acre-feet per year. If we consider controlling salt-cedar on only a portion of these lands, which might be more realistic, re-establishing native bosque on 10% of the lands (3,000 acres) would resulting in a reduced depletions of about 2,200 acre-feet of water per year.

Alternately, the region could focus on areas where salt cedar habitat can be eliminated. The benefit of eliminating habitat is that salt-cedar is replaced by scrub, rather than bosque, further reduces depletions. A potential area where this might work is on the east side of the Rio Grande below San Acacia. This area is a roughly 4 mile wide stretch of land that was once used for agriculture. This area was abandoned by the MRGCD when it became too waterlogged to plant. This area is cut off from the Rio Grande by a continuous levee, and is also the outlet for multiple arroyos, which, because of the levee, no longer connect to the river. The result is that significant amounts of water are released into this former farmland on a regular basis, maintaining a high water table and providing excellent conditions for salt cedar growth. It is likely that if the arroyos in this area were reconnected to the river, salt cedar habitat would be reduced. Work to reconnect the major arroyos to the river appears to have been recently started. If this land were drained such that some portion of it became inhospitable to riparian growth, the resulting water usage on the drained land would drop to roughly the effective precipitation, reducing depletions by roughly 3 to 3.5 acre-feet of water per acre annually. Maintenance of the drainage system would be required to prevent salt-cedar from re-vegetating the area. However, this maintenance is likely smaller than that required to keep salt-cedar from re-vegetating areas that support active riparian communities.

A developing area of riparian vegetation is in the now-exposed Elephant Butte northern basin. As mentioned in the first alternative, successful completion of the pilot channel is a critical step; however, additional drainage and maintenance would probably be required to substantially reduce the potential for riparian re-colonization.

There are several potential complications to controlling non-native vegetation. First, the removal of exotic vegetation may potentially conflict with Endangered Species Act over southwest willow-flycatcher habitat. Second, once non-native vegetation is removed, it will need to be maintained on a regular basis, or the area will need to be returned to more “natural” conditions such that non-natives have less advantage over native vegetation. Cost of on-going maintenance, in the former scenario, or the potential for increased water use resulting from re-engineering the area to recreate "natural" conditions, should be figured into the planning. Third, because non-native riparian vegetation, such as salt cedar, consume large quantities of shallow groundwater, to some extent they control shallow groundwater levels. Reconstruction and maintenance of the LFCC to ensure adequate drainage will be important to ensure that water-logging and evaporative losses are not exacerbated upon removal of salt cedar. Water table response and alternatives for water table elevation management should be built in to any vegetation removal plan.

6 Restrict transfer of water out of the planning region

Implementation of this option will allow the region to maintain it's current water supply. We are not aware of a mechanism for restricting water transfer out of the planning region, but would encourage the planning region to critically review any such proposals or transfer applications.

Transfers, within or beyond the planning region, must recognize hydrologic reality if the river is not to suffer detrimental impacts. Assessment of hydrologic reality includes quantification and comparison of incidental conveyance losses and return flows at both the "move-from" and the "move-to" locations. These assessments can be technically complex, and require evaluation of local hydrologic conditions throughout the impacted areas and river reaches. In many cases, a reduction in the diversion or consumptive use will be required to preserve the "status quo" water balance after the transfer occurs, to compensate for increased losses to the new point of use.

Transfers over large distances are particularly difficult to implement without risk to the existing hydrologic balance. First, certainty in evaluating comparative conveyance losses and return flows becomes more difficult to achieve when transfers occur across large distances, for example, as would occur with water transferred outside of the planning region. Second, some elements of the existing infrastructure are sensitive to the magnitude of use; for example, some canals require a given head or volume of water for efficient delivery. Substantial transfers out of one area may jeopardize the efficient continuation of present uses within the move-from area.

7 Storage of reservoir water at higher altitudes/latitudes

Moving storage of Elephant Butte Reservoir water to northern reservoirs has the potential to reduce total reservoir evaporation. Table 2, below, illustrates the potential reduction in evaporative loss for various reservoir storage scenarios. Reduction in evaporation in these scenarios, which are based on moving 100,000 acre-feet of storage from Elephant Butte to Abiquiu or Cochiti Reservoirs, which have lower evaporation rates than Elephant Butte as a result primarily of climate, range from 2,070 to 4,960 acre-feet. These calculations are based on current area-capacity tables for the specified reservoirs, and on measured annual pan evaporation rates, adjusted by a factor of 0.7 as is customary applied by the USBR and the ACOE in New Mexico. (These values are different from those in the DBS&A analysis presented to the Water Assembly, February 2003.)

Table 2: Reduction in evaporative loss resulting from moving water storage from Elephant Butte to Northern Reservoirs.

Elephant Butte Reservoir		Destination Reservoir		Evaporative loss reduction (acre-feet)
Storage Volume (acre-feet)	Water Moved (acre-feet)	Name	Volume Before Move (acre-feet)	
1,000,000	100,000	Cochiti	50,000	2,070
1,000,000	100,000	Abiquiu	50,000	4,420
2,000,000	100,000	Cochiti	50,000	2,610
2,000,000	100,000	Abiquiu	50,000	4,960

The values in Table 2 are based on differences in evaporation between Elephant Butte and the destination reservoir, at the specified reservoir levels. These values do not take into account potential changes in conveyance loss resulting from moving water to Elephant Butte on a different schedule than that now applied. Increases in conveyance loss, if water were released slowly during the summer rather than routed to Elephant Butte during the spring flood wave, could potentially exceed the water savings for all options shown above, resulting in a net water consumption rather than a water savings, and negatively impacting New Mexico's ability to meet Compact delivery requirements. Data is presently unavailable to precisely quantify the increase in conveyance losses during the summer, but may be available in the near future (ISC staff, personal communication).

The Table 2 water savings values also do not account for riparian colonization of, and subsequent evapotranspiration losses from, the newly exposed sediments in the Elephant Butte delta area resulting from shifting water upstream. Rough quantification of these losses is presented below:

- For a change in storage of 100,000 acre-feet, starting from a base storage of 1,000,000 acre-feet, reservoir surface area changes from 20,860 to 19,320 acres.
    - If we assume 40% of this is in the northern delta, this is 640 acres.
    - If this area were populated by riparian growth with an evapotransipiration rate of 4 acre-feet/acre, resulting losses would be 2,560 acre-feet.

- For a change in storage of 100,000 acre-feet, starting from a base storage of 2,000,000 acre-feet, reservoir surface area changes from 35,600 to 34,000 acres.
    - Using the above assumptions, resulting losses would be 2,464 acre-feet.

Table 2 water savings values should therefore be reduced by approximately 2,500 acre-feet (for the movement of 100,000 acre-feet of water) to account for delta evapotranspiration.

Additionally, there are many legal issues involved in implementing changes in reservoir storage. A complex suite of Congressional authorizations, and the Rio Grande Compact, control storage, releases and deliveries associated with both Elephant Butte and other reservoirs. These institutional controls are substantial; alteration of these institutional controls would be very time consuming and is beyond the scope of the regional planning process, though the region could lobby for changes.

Any reduction in evaporative depletions from changes to reservoir storage, assuming transit losses are not subsequently increased, effectively increase the amount of water available for other uses in the Middle Rio Grande (Cochiti to Elephant Butte) region. Under New Mexico water law, this water belongs "to the public and is subject to appropriation for beneficial use" (New Mexico statutes, 1978, 72-1-1). In the Rio Grande Basin, which is considered by the State Engineer to be fully appropriated, these waters would satisfy other established water rights (which may be subject to shortage), subject to the constraints of the Rio Grande Compact.

Table 2: Ranking of Hydrologic Impacts

A rough quantification of potential water savings resulting from each alternative, based on the assumptions outlined in the above text, is given below. Additionally, a qualitative hydrologic impact score is assigned for reduction in water diversions. The approximate water savings and diversion reduction scores do not reflect consideration of cost, feasibility, or other non-hydrologic constraints:

1 = no impact likely or not applicable
2 = modest improvements possible
3 = potentially helpful improvements
4 = potentially significant improvements
5 = potentially large improvements

Alt #	Alternative description	Approximate Reduction in Depletion (acre-feet/year)	Score-Diversion
1e	Evaporation control -reduced water surface areas	0 to 40,000	1
3e	Improve off-farm irrigation efficiency	200, not including seepage to LFCC	5
3i	Improve on-farm irrigation efficiency	Not quantifiable	3
4b	Control brush and weeds along water distribution system and drains	0	1
4d	Remove exotic vegetation on a wide-scale	2,200 (for 10% of lands)	2
7b	Restrict transfer out of the planning region	Not quantifiable	3
1d	Storage of reservoir water at higher alt./lat.	0 to 2,500, not including conveyance losses	1

Appendix E2

SSPA Groundwater Study
Rio Grande and La Jencia Basins

Socorro-Sierra Planning Region Water Planning Study: Groundwater Resources in the Rio Grande and La Jencia Basins

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Boulder, Colorado

July 2002

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Socorro-Sierra Planning Region Water Planning Study: Groundwater Resources in the Rio Grande and La Jencia Basins

Prepared for:

New Mexico Interstate Stream Commission

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1.0 INTRODUCTION

The Socorro-Sierra Planning Region is developing a regional water plan as part of the State of New Mexico regional water-planning program. Regional water-planning activities are funded through and overseen by the New Mexico Interstate Stream Commission (ISC). The purpose of regional water planning is to protect New Mexico's water resources and to ensure that each region is prepared to meet future water demands. The regional water planning process is more fully described in the Regional Water Planning Handbook (ISC, 1994). The Socorro Soil and Water Conservation District (SWCD) is coordinating the development of the Socorro-Sierra regional water plan, with oversight by a Steering Committee comprised of professionals and public participants.

The first step in the water planning process is to characterize the region's available water supply. The water supply of non-tributary groundwater basins within the Socorro-Sierra planning region is described in a previous report prepared by Daniel B. Stephens & Associates, Inc. (DBSA), in conjunction with Hydrosphere Resources, Inc (Revised Draft, February 7, 2001). To avoid potential duplication of effort, the DBSA study did not address the water supply of tributary groundwater basins that were included within the study area of the Middle Rio Grande Water Supply Study (MRGWSS), prepared by S.S. Papadopulos & Associates, Inc. (August 2000), for the Army Corps of Engineers (ACOE) and the ISC.

The MRGWSS report characterizes the water supply over a larger study area, including a significant portion of the Socorro-Sierra Planning Region, but also including the Middle Rio Grande Planning Region and adjacent areas. The MRGWSS characterizes surface water and associated tributary groundwater supplies in the Rio Grande Basin between Cochiti Reservoir and Elephant Butte Reservoir. The MRGWSS addresses the water supply question broadly, and provides a probabilistic characterization of the regional conjunctive use water supply. Although extensive water supply information relevant to the regional water planning process was compiled and integrated under the MRGWSS, the MRGWSS was not scoped to present this information in the format of the regional water planning template (ISC, 1994) for the individual planning regions.

This report presents water supply information, using the format of the regional water planning template, for two tributary groundwater basins in the Socorro-Sierra Planning Region. This report complements the DBSA study and addresses water supply conditions within additional areas of the Socorro-Sierra Planning Region. Specifically, this report characterizes the water supply in the La Jencia Basin and in the portion of the Rio Grande Basin from the Socorro-Valencia county line to Elephant Butte Reservoir. This information can be combined with results of the DBSA study and other studies on water rights, water demand and water use alternatives to support a regional water plan. Similar to the DBSA study, this study does not address water quality issues beyond a general level and does not address the cost or feasibility of developing groundwater resources.

2.0 OVERVIEW

The Socorro-Sierra planning region is defined by the extent of both Socorro and Sierra counties in New Mexico. This study characterizes groundwater resources in the aquifers hydraulically connected to the Rio Grande within the Middle Rio Grande Water Supply Study (MRGWSS) area of study that also fall within the Socorro-Sierra planning region. Specifically, this assessment addresses groundwater conditions in the Rio Grande Basin within the planning region as far south as Elephant Butte Reservoir; and, in the La Jencia Basin.

For each basin, available groundwater data were inventoried. These data included information compiled as part of the MRGWSS in addition to relevant data obtained from other public sources. These data were used to assess the groundwater resources in major aquifers in each basin. Specifically, this assessment includes:

- Information regarding physiography, geology, hydrogeology, groundwater yield, aquifer recharge and storage. The bibliography compiled for the MRGWSS, augmented with additional publications obtained or reviewed since the completion of that study, is included in Appendix A.

- Key well and water level data for each basin. These data were obtained from the USGS (data transmittal, Robert Gold- Public Information Officer, 2001). Information in this database includes well data provided by both the USGS Groundwater Site Inventory (GWSI) database and the National Water Information System (NWIS) database. Well and water level data for the areas encompassed by and within 5 miles of the Rio Grande and La Jencia Basins are included in Appendix B. Additional water level data were obtained from the U.S. Bureau of Reclamation and the City of Socorro.

- Geologic cross-sections obtained from existing publications and maps showing groundwater elevation data.

- A summary of the hydraulic properties of the primary aquifer in each basin.

- A general water-quality assessment for the groundwater resources in each basin.

- An evaluation of recharge and storage of groundwater in basins and a discussion of constraints on withdrawal of groundwater in storage due to impacts on the Rio Grande.

This information will supplement the water planning information previously prepared under the DBSA study for the non-tributary groundwater in the San Augustin, Alamosa Creek, Jornada del Muerto and Tularosa Basins. Data provided in the appendices of the DBSA report regarding land use and ownership, surficial geology and annual precipitation for the entire Socorro-Sierra planning region will not be duplicated in this report. However, additional well and groundwater information specific to the Rio Grande and La Jencia Basins is incorporated into Appendices B and C of this document.

3.0 RIO GRANDE BASIN

The Rio Grande Basin is a north-south trending basin that originates in southern Colorado, extends through the entire length of New Mexico, through parts of Texas and to the Gulf of Mexico. This study describes an area within the Rio Grande Basin extending approximately from the Socorro-Valencia county line to Elephant Butte Reservoir and includes those areas underlain by the Santa Fe Group (Figure 1). The study area includes the southern portion of the Albuquerque-Belen Basin, the Socorro Basin, the San Marcial Basin and the Engle Basin.

3.1 **Physiography**

The east and west boundaries of the Rio Grande Basin in the study area are defined by upland areas that roughly parallel the Rio Grande. On the east, the basin is bounded by the Los Pinos Mountains, the Joyita Hills, the Lomas de las Canas Uplift, Cerro Colorado, Little Pasqual Mountain and the Fra Cristobal Range. The western boundary is formed by the Ladron Mountains, the Lemitar Mountains, the Chupadera Mountains, the Magdalena Mountains, the San Mateo Mountains, and the Cuchillo Range. The northern and southern boundaries of the basin extend beyond the study area.

The climate of the Rio Grande Basin in the study area is predominantly semi-arid. Average annual precipitation in the basin, as measured in Socorro, is 9.35 inches. Over half of the precipitation occurs during the months of July, August, September and October. July is the warmest month of the year and has an average temperature of 78 ^{o}F while the coldest month, January, has an average temperature of 36 ^{o}F (Anderholm, 1987).

Elevations of the Rio Grande valley floor in the study area range from approximately 4,700 feet above mean sea level (amsl) in the north to 4,450 feet amsl at the north end of Elephant Butte Reservoir. Elevations in adjacent mountain areas range from about 6,000 feet to 10,000 feet amsl.

The principal surface water feature is the Rio Grande, which flows through the entire length of the Rio Grande Basin. The Rio Puerco, Rio Salado, Nogal Canyon Creek, Milligan Gulch and Alamosa Creek are tributaries to the Rio Grande in the study area. Other surface water features include the various conveyance channels, acequias, ditches, laterals and drains associated with irrigation in the basin.

3.2 Geology

The most important structural feature in the Rio Grande Basin is the Rio Grande trough. This fault trough is a complex system of horsts and grabens extending the entire length of New Mexico. Individual basins are formed by asymmetrical groups of tilted fault blocks. Although the general trend of the fault zone is north-south, individual faults are arranged *en echelon* and are generally oriented northeast and northwest (Spiegel, 1955). The planes of most faults within basins and those that form basin boundaries flatten with depth and have normal offset (Hawley and Haase, 1992). Generalized stratigraphic cross sections of the Rio Grande Basin near Socorro (A-A') and near the northern boundary (B-B') are shown in Figures 2 and 3.

Basin fill was deposited primarily by alluvial, lacustrine and eolian processes, although a significant thickness of volcanics is present in many locations. Quaternary alluvial and fluvial deposits are generally less than 50 feet thick (Speigel, 1955) but have been estimated to exceed 100 feet in some locations (Anderholm, 1987). Quaternary deposits overlie rocks of the Quaternary-Tertiary Santa Fe Group. The contact between the Santa Fe and the overlying quaternary alluvium is often approximate and arbitrary because of similar depositional mechanisms and lithology (Smith, 1983). However, Quaternary valley fill in the floodplain is more discernable, being mostly clay to sand, and is a locally important aquifer.

The Sierra Ladrones Formation, a Quaternary-Tertiary unit corresponding to the Upper Santa Fe Group, and the Popotosa Formation, a Tertiary unit corresponding to the Lower Santa Fe Group, are the principal components of the Santa Fe Group in the Rio Grande Basin within this study area. The Sierra Ladrones Formation consists of poorly sorted conglomerate and sandstone deposits of piedmont slope and alluvial fan origin that interfinger with mud, silt and sand flood plain deposits and sandstone and conglomerate axial river deposits. The thickness of the Sierra Ladrones Formation has been estimated to be at least 1,000 feet in the Socorro Basin (Chapin et al, 1978) and between 2,000 and 4,000 feet thick east of Socorro Peak (Sanford, 1978 as referenced in Chapin et al, 1978). Chamberlin (1999) and Chamberlin et al (2001) estimated the maximum thickness of the Sierra Ladrones Formation in the Lemitar and Socorro Quadrangle to be 1,000 to 1,300 feet.

The Upper Popotosa Formation (also referred to as the Popotosa confining unit) is composed of claystones, mudstones, siltstones, sandstones, conglomerates and basalt flows. The thickness of this unit is estimated to range from 1,200 to 2,500 feet (Chapin et al, 1978; Chamberlin, 2001). The Lower Popotosa Formation (the Popotosa aquifer) consists of mudflow deposits, fanglomerates and minor lacustrine deposits. The Lower Popotosa is well indurated and intensely fractured near fault zones. Thickness of the Lower Popotosa

Formation can reach 1,500 feet (Chapin et al, 1978). The overall thickness of the Popotosa Formation was estimated by Machette (1978) as being at least 6,500 feet, with considerable thickening toward the source areas. Chamberlin (1999) estimated a 3,000 to 5,000 foot thickness of Popotosa Formation under the western flank of the Socorro Basin, but notes that the lower unit is wedge shaped and highly variable in thickness, ranging from 0 to 1,000 feet. At the southern end of the study area, drilling data presented in Hawley et al (1978) indicated a total thickness of Santa Fe Group ranging from 1,450 feet to 6,524 feet. The thickness of units comprising the Santa Fe Group appears to be highly variable and location dependent.

The rocks of the Santa Fe Group overlie Tertiary pre-rift and syn-rift volcanic rocks consisting of ash-flow tuffs and lava flows. These volcanics can be up to 7,000 feet thick and in some locations overlie Tertiary rocks of the Baca Formation and Datil Group described by Osburn and Chapin (1983). The Baca Formation is made up of conglomerates, sandstones and shales while the Datil Group is primarily volcanic in origin, consisting of up to 2,000 feet of ash-flow tuffs and volcanoclastic sandstones and conglomerates. Where present, these rocks overlie sedimentary Mesozoic and Paleozoic strata consisting of limestones, sandstones, siltstones, shales and conglomerates. The thickness of individual formations of Mesozoic and Paleozoic age varies along the length of the Rio Grande Basin within the study area. These rocks, primarily limestones, are grouped into four formations: the Madera Limestone, the Sandia Formation, the Kelly Limestone and the Caloso Formation. This 2,000 foot sequence of Pennsylvanian rocks in turn overlie the Precambrian basement rocks composed of igneous and metamorphic rocks exposed on Socorro Peak, the northeast side of the Socorro Basin and in the Magdalena and Chupadera Mountains. These Tertiary volcanics and Mesozoic and Paleozoic units comprise minor aquifers only in limited areas along basin margins.

3.3 Hydrogeology

Regional groundwater flow in the basin is generally from the upland areas on the east or west towards the river; and, within the valley, from north to south along the Rio Grande. Recharge to the groundwater system occurs as groundwater inflow, mountain front recharge, direct infiltration of precipitation on the basin floor and seepage from the surface water features in the basin. Discharge occurs as evaporation, transpiration by crops and riparian vegetation, flow from the shallow aquifer into surface water features, groundwater pumping, and outflow of groundwater from the basin.

3.3.1 Aquifer Properties

The Santa Fe deposits can be divided into an Upper unit, comprised of the Sierra Ladrones Formation and a Lower unit, made up of the Popotosa Formation. The Upper Santa Fe Group and Quaternary deposits form the "shallow" aquifer system; and, the lower part of the Popotosa Formation forms the Popotosa aquifer, with the intervening upper part of the Popotosa Formation comprising the Popotosa confining bed (Anderholm, 1987). Together, the shallow aquifer and the Popotosa aquifer are termed the "principal aquifer system" (Anderholm, 1987). However, because nearly all producing wells are completed in the shallow aquifer system, reported aquifer properties for the Santa Fe Formation are assumed to relate to the shallow aquifer system.

Transmissivity of the Santa Fe Group has been estimated (USGS, 1979) to range from approximately 7,000 to 21,000 square feet per day (ft^2/d) with an average hydraulic conductivity of approximately 60 feet per day (ft/d) and storage coefficient ranging from 0.0002 to 0.0006. Anderholm (1987) presented estimates of hydraulic properties of the Upper Santa Fe Group based upon information from Hantush (1961) and Theis (1938). The estimates included transmissivity ranging from 6,700 to 27,000 ft^2/d, hydraulic conductivity of approximately 41 ft/d, and a specific yield of 0.23. The DBSA study presented additional aquifer data from Waldron (1956), which included aquifer test results indicating a transmissivity range from 3,700 ft^2/d to 26,000 ft^2/d and storage coefficient between 0.0084 and 0.05. Aquifer test results for specific wells in the Socorro region, i.e., those described in consultant reports for the City of Socorro or other well owners, indicate transmissivity ranging from less than 1,000 ft^2/d to greater than 30,000 ft^2/d. These estimates of aquifer properties are summarized in Appendix C.

3.3.2 Well Data

The USGS provided records of 734 wells or springs in the Rio Grande Basin within the study area (Gold, 2001). The USGS database indicates that most water supply wells are completed in the Quaternary alluvium or the Santa Fe Group. More precisely, most wells in the Rio Grande Basin within the study area are completed in the Upper Santa Fe Sierra Ladrones Formation (P. Johnson, 2001, personal communication). Well depths range from 6 feet to 630 feet, although most are less than 300 feet deep.

3.3.3 Well Yield and Water Levels

Reported yields range from 0.5 to 2,700 gallons per minute (gpm) (Roybal, 1991), although nearly 70 percent of reported yields are less than 50 gpm. Municipal water supply wells for the City of Socorro consistently yield between 540 and 850 gpm. The few wells that penetrate the Mesozoic and Paleozoic strata outside the basin margins generally yield less than 30 gpm (Anderholm, 1987).

Based upon well records provided by the USGS, groundwater elevations in wells along basin margins and in the inner valley in the Rio Grande Basin for which water level data span several years do not appear to show a consistent trend toward either increasing or decreasing water levels in the past 10 to 20 year period (Figures 4 and 5). However, water levels within the inner valley have changed with development of the irrigation project works. Anderholm (1987) reported data from Bloodgood (1930) and Theis (1938) that indicated that the average depth to water in the valley of the Socorro region was 2.37 feet in the 1920s. After construction of drains and laterals was completed in 1936, water levels in these same observation wells dropped by approximately three feet.

Figure 6 provides a general representation of groundwater elevations in the Rio Grande Basin in the study area. These water level data were selected from wells identified as utilizing either the Upper Santa Fe Group or shallow Quaternary basin-fill units as sources of groundwater. Water level data collected during winter months during a several year period were used to construct the water level contour map in Figure 6. Depth to water ranges from ground surface to nearly 500 feet, although in most valley locations the water table is less than 10 feet deep (Appendix B). The depth to groundwater in the vicinity of the City of Socorro ranges from about 30 feet at the Olson and School of Mines wells, to over 200 feet in the South Industrial Park area southwest of Socorro.

3.3.4 Recharge

Recharge to the groundwater system in the Rio Grande Basin occurs by direct infiltration of precipitation, infiltration of runoff from upland areas at basin margins, seepage from surface water features, and groundwater flow into the basin from adjacent groundwater basins. In some locations, recharge can also occur by seepage of ephemeral streams.

The quantification of recharge has always been of interest to hydrologists for purposes of understanding basin water budgets. Similarly, planners are interested in recharge estimates as an indicator of the sustainable water supply. However, the characterization of recharge often falls short of expectations in both of these areas. From a technical point of view, estimation of recharge in semi-arid basins on a basin-wide scale is difficult and subject to high uncertainty. From a planning point of view, while one can argue that the quantity of recharge is akin to the renewable supply, it would be incorrect to assume that recharge is an untapped or new supply. Basin recharge presently serves both existing human uses and other discharge components (i.e., riparian use, basin outflow) of the water budget. Only by shifting water from existing uses or discharge components, would recharge become available to meet new water needs. For these reasons, the estimated quantities of recharge provided in a planning study should be used with caution.

Methods available for quantifying recharge include direct estimation; indirect calculation through a water budget approach; regression models relating more readily measurable parameters to estimates from either of the previous methods; and, water quality mixing studies. In this study, recharge estimates using several of these approaches are provided and compared. These estimates do not include seepage from the river and irrigation system, or, groundwater inflow from adjacent basins.

Methods for estimation of recharge utilized in this study include the Maxey-Eakin method (1949), as described and applied in the DBSA study; the Dewey-Hearne method as described and applied by Roybal (1991); and, comment on these methods reflecting recent water quality mixing studies conducted in the Rio Grande Basin. As will be apparent in the following sections, there is a wide range in estimates of recharge. In part, this reflects the inclusion of different recharge processes by different methods. However, much uncertainty exists in estimation of recharge and probably none of the estimates provided numbers should be accepted as the "last word" on this topic.

Estimation of Recharge by Maxey-Eakin Method

Maxey and Eakin postulated a simple model relating recharge to precipitation, using information from numerous water budget studies in Nevada to parameterize the model. Their relationship for estimating recharge from precipitation is:

$$\textbf{Volumetric Recharge} = S\, A_i(r_i P_i)$$

where: A_i = area of basin between two isohyets,
i = precipitation contour,
r_i = percentage of precipitation that becomes recharge, and
P_i = average annual precipitation.

This method is based upon the assumption that a direct relationship exists between precipitation and recharge. Estimates of the percentage of precipitation that becomes recharge were based upon water balance results from 21 groundwater basins in Nevada and are summarized in Table 1. The method yields an estimate of recharge corresponding to both mountain-front recharge and any other recharge that may occur through the basin floor.

Because the empirical parameters for this method are derived assuming a total estimate of recharge, the parameters may not support the separation of mountain-front recharge from basin floor recharge, even though the model structure lends itself to separation using precipitation zones. Furthermore, it should be noted that because this method was developed using basins with no surface water outflow, the calculated recharge in fact represents the basin yield. When applied to basins with surface water outflow, as occurs in the Socorro-Sierra County tributary basins discussed in this report, this method will overestimate recharge by an amount equal to the portion of surface water yield attributed to run-off. In this analysis, the method will be used to estimate the total basin yield, including recharge and tributary surface flow.

Table 1

Percentage of Recharge (Total Yield) from Precipitation using the Maxey-Eakin Method

Precipitation Range (inches)	Recharge (Yield) Percentage
0-8	0
8-12	3
12-15	7
15-20	15
>20	25

The average annual precipitation data obtained from the New Mexico Resource Geographic Information System Program (RGIS) were used to delineate zones with precipitation falling within the tabulated ranges, for areas within the contributing watershed of the study area. Recharge rates, tabulated above, were used to estimate the total volumetric recharge to the Rio Grande Basin in the study area. Recharge estimates by this method, and other methods discussed below, are summarized in Table 2 for three sub-areas of this study area shown in Figure 1.

Table 2
Estimated Recharge for the Rio Grande Basin in the Study Area
(acre-feet/year)

Sub-Area(s)	Total Basin Yield by Maxey–Eakin Method	Mountain Front Recharge by Chloride-Balance (Anderholm, 2001)	Mountain Front Recharge by Hearne-Dewey (Roybal, 1991)
Southern Albuquerque-Belen	8,200	1,100	2,900
Socorro and San Marcial	40,200	NE	16,700
Engle (Sierra County)	15,400	NE	NE

* NE = Not estimated

Estimation of Recharge by the Hearne and Dewey Method

Anderholm (1987, 1999) and Roybal (1991), noting that the principal recharge mechanism is runoff along mountain fronts, provided estimates for mountain-front recharge using a method developed by Hearne and Dewey (1988). The Hearne and Dewey method, as described by Roybal, utilizes a regression model based on winter precipitation, basin area and channel slope. Recharge estimates from this method reported by Roybal (1991) are summarized in Table 2 for two sub-areas of this study area. The estimate for the southern part of the Albuquerque-Belen basin includes 724 acre-feet per year (af/y) from the Ladron Mountains and 2,170 af/y from the Los Pinos Mountains. Roybal also estimates recharge through the beds of the Rio Salado, Rio Puerco and Abo Arroyo, which are not included in this estimate of mountain front recharge. The estimate shown for the Socorro and San Marcial sub-basins includes the following components reported by Roybal: 4,348 af/y from the Socorro and Lemitar Mountains, 4,340 af/y from the San Mateo Mountains; 6,520 af/y from the Magdalena Mountains and 1,450 af/y from the eastside of the Socorro Basin. Of this quantity, approximately 11,000 af/y flows towards the San Marcial sub-basin.

A similar regression method is used by Anderholm (1987) to estimate mountain front recharge to the Socorro basin from the eastside and from the Socorro-Lemitar Mountains. This calculation, using a method attributed to Dewey, 1982, estimates recharge to the Socorro Basin of 2,000 acre af/y, which is less than half of that estimated by Roybal for this area. The reason for the difference in these estimates has not been researched.

Chloride-Balance Method

The chloride-balance method estimates mountain-front recharge in basins using a chloride balance on the basin scale. This method requires an estimate of mean annual precipitation, the chloride concentration in bulk precipitation, and the chloride concentration in groundwater near the mountain front. Anderholm (2001) calculated recharge using both the regression yield method (Hearne and Dewey, 1988 and Waltemeyer, 1994) and the chloride balance method for the eastern side of the Middle Rio Grande Basin. The Abo Arroyo and Los Pinos Mountains sub-areas of the Anderholm study fall within the upper portion of this study area (Socorro-Valencia county line to San Acacia). The derived percentage of annual precipitation resulting in mountain front recharge for these is shown in Table 3.

Table 3
Percentage of Annual Precipitation Resulting in Mountain Front Recharge

Basin sub Area	Method		
	Hearne and Dewey (1988)	Waltemeyer (1994)	Chloride -Balance
Los Pinos Mountains	1.8%	5.5%	0.9%
Abo Arroyo	2.1%	9.0%	0.7%

The Hearne-Dewey method yields an estimate of 2 percent, for that portion of precipitation resulting in mountain front recharge. An alternate regression method developed by Waltemeyer employs annual precipitation, rather than winter precipitation in the regression model, and is postulated by Anderholm to be better suited for this southern area of the basin where snowmelt is less significant component of recharge. Using the Waltemeyer model, an estimate of 5 to 9 percent was derived for the percentage of precipitation resulting in mountain-front recharge (although, Anderholm notes that the estimate of 9 percent for the Abo sub-area may not be valid due to the fact that the drainage area size is outside of the range used to develop the model). The chloride-mass balance model yielded estimates of about 1 for recharge as a percent of precipitation. Anderholm notes that the smaller estimate may be a function of physical conditions that would limit recharge in the southern area of the basin such as greater evaporation or transpiration and longer travel times permitting these processes to occur. Anderholm also notes that this estimate could be influenced by the applicability of several method assumptions (for example, the use of winter precipitation could result in an underestimate of recharge in this area; and, errors in chloride assumptions which could influence the estimate in either direction).

Regardless of the uncertainties in estimation, this work suggests significantly lower recharge rates than would have been obtained using the Maxey-Eakin method, which would derive a recharge rate of 7 percent for these areas. This is consistent with the understanding that Maxey-Eakin better represents total basin yield, rather than recharge to groundwater. The chloride balance results suggest that recharge may be as low as one quarter to one half of that calculated by the regression methods. Clearly, more research is needed to reconcile these differences among estimation methods. However, these results suggest that as a conservative estimate, water planners might want to assume a recharge estimate below that obtained by the regression methods.

3.3.5 Groundwater in Storage

Although a vast amount of groundwater resides in storage within the Rio Grande Basin, the long-term mining of this groundwater for water supply purposes is untenable due to water quality limitations, the potential for subsidence, and depletions to the river system. Of primary importance in assessing the feasibility of developing groundwater from storage is the role played by surface waters in the hydrologic system. The Rio Grande and the man-made surface water features exert significant control on groundwater conditions. There is a direct connection between groundwater and surface water in the Rio Grande Basin. Seepage from ephemeral streams and rivers recharges the groundwater system. Groundwater discharge serves to supplement in-stream flows. As groundwater levels in permeable material adjacent to and underlying the Rio Grande change, the rate, and even the direction, of seepage to or from the river can change. Conversely, river stage changes affect water levels in nearby wells. Drains intercept infiltrating irrigation water, regional groundwater flow, and river seepage and are the primary control of water levels in irrigated areas. Because of the stream-aquifer connections in this basin, the extraction of groundwater will impact the flow of the river and/or return flows to the river via drains or the Low Flow Conveyance Channel.

Diversions and use of the surface water supplies of the Rio Grande are limited by the Rio Grande Compact. The Compact specifies delivery obligations to Elephant Butte Reservoir and thereby subjects New Mexico to limitations on use. Given present development conditions, on average, water supplies are barely adequate to meet existing uses (S.S. Papadopulos, 2000). The New Mexico Office of the State Engineer requires offset of any additional depletions to the Rio Grande by retirement of water rights sufficient to offset impacts of new uses.

Assuming that adequate offsets for surface water impacts are obtained, some use of groundwater in storage might be desirable as part of the regional water plan. A first-order approximation of the volume of groundwater in storage that might be useable, subject to the constraints noted above, can be estimated by multiplying an assumed "recoverable" volume of aquifer that might be de-saturated by groundwater pumping by the specific yield of the aquifer. In the Rio Grande Basin, the Santa Fe Group is the primary source for groundwater. The areal extent of the Santa Fe Group was determined from basin areas as shown in Figure 1. Table 4 summarizes parameters used for this estimate of groundwater in storage.

Table 4
Groundwater in Storage[1] – Rio Grande Basin in the Study Area

Parameter	Value
Area (acres)	1,863,395
De-watered Interval (feet)	10
Specific Yield	0.10
Groundwater Stored (acre-feet)[2]	1,863,395

[1] Upper 10 feet throughout study area
[2] The feasibility of recovering groundwater stored in this interval has not been evaluated

Some might argue that the assumed de-watered interval of 10 feet does not tap the vast available resources of the aquifer. While 10 feet is a small interval in the context of the aquifer depth, as a practical matter, it would be virtually impossible to withdraw this amount throughout the basin without encountering adverse impacts. Furthermore, it would be difficult to find adequate quantities of existing uses to retire for offsetting the stream depletions resulting from groundwater development of this magnitude. More realistically, groundwater extraction on a smaller scale could be part of a viable aquifer storage and recovery project, whereby water is extracted for use during droughts and recharged during wetter periods. In an aquifer storage and recovery project, the impacts of groundwater pumping will be lagged in impacting the river, potentially delaying the need for offsets to a wetter period when recovery might be more easily implemented. On the other hand, the practicality of using the aquifer as a storage reservoir is not clear and would require evaluation in a feasibility study.

3.3.6 Water Quality

Water quality in the Rio Grande Basin has a high degree of spatial variability. High concentrations of chloride are present in groundwater in the northern part of the Rio Grande Basin, in locations corresponding to the southern Albuquerque-Belen Basin and the northern Socorro Basin, and in the central basin near the Bosque del Apache Wildlife Refuge. Chloride concentrations presented by Anderholm (1987) indicate average chloride concentrations of approximately 600 mg/L in the northern part of the basin, 50 mg/L near Socorro, and 400 mg/L in the central part of the basin. Anderholm (1987) suggests that the high chloride concentrations in the northern part of the basin are due to upward movement of deep basin groundwater in response to a decrease in overall depth and width of principal water bearing formations in the vicinity of San Acacia. This deep basin groundwater then mixes with groundwater and irrigation return water in the upper hydrostratigraphic units. The cause for the high levels of chloride in groundwater in the vicinity of the Bosque del Apache Wildlife Refuge is unknown, but has been postulated (Anderholm, 1987) to be due to either leakage of geothermal water associated with the Socorro Peak Known Geothermal Resource Area into the basin along the Capitan lineament or upward movement of deep basin water, similar to what may be occurring in the northern Rio Grande Basin.

3.4 Groundwater Yields by Aquifer

3.4.1 Principal Aquifer

The principal aquifer includes the Quaternary Alluvium, the Upper Santa Fe Group Sierra Ladrones Formation and the Lower Popotosa Formation in the Lower Santa Fe Group.

Little exploration of the deeper Popotosa aquifer has occurred, thus, this discussion primarily relates to the shallow aquifer. The hydraulic connection between the Rio Grande and the presently developed regions of the principal aquifer (the shallow system) indicates that large-scale extraction of the groundwater in storage will be impractical. Without offset, pumping from most areas of the shallow aquifer will increase seepage from the Rio Grande, or reduce drain/LFCC return flows to the river, thereby reducing in-stream flows and deliveries to downstream users. New groundwater development can occur only if adequate stream depletion offsets are obtained through the retirement of existing water rights or reduction of other consumptive uses.

However, the presence of hydrologic discontinuities along basin margins and the possible existence of low permeability units within the Popotosa Formation (Bruning, 1973) may limit or delay the hydrologic impacts of pumping from the deep Popotosa aquifer or from specific, although limited, zones of the shallow aquifer. Investigation to establish the extent of such postulated hydrologic discontinuities would be needed to support the possibility for development under reduced offset conditions.

3.4.1.1 Sustainable yields

Sustainable yield represents the amount of water that can be obtained over the indefinite future, or, in a steady-state condition. In a steady-state condition, basin inflow is equal to basin outflow. Some authors equate sustainable yield with basin recharge. However, if sustainable yield under development is assumed equal to recharge, then natural discharge ceases and is shifted to the uses served by the sustainable yield. In the Rio Grande Basin, given that the obligations under the Rio Grande Compact are met in part by existing basin recharge and outflow patterns, basin recharge can not be assumed to be available for development; and, sustainable yield shouldn't be equated with recharge. Rather, sustainable yield should be equated with the amount of depletions occurring under present development conditions. New uses can only be sustained with a commensurate decrease from existing uses. In theory, sustainable yield also can be increased by decreasing natural depletions to the river system, i.e., evaporative or riparian depletions. The feasibility or desirability of decreasing natural depletions would require careful evaluation, particularly in light of cultural resources and endangered species issues.

3.4.1.2 Drawdown by Level of Development

Examination of well field data from the City of Socorro provides a general measure of the drawdown to be expected in the principal aquifer in the Rio Grande Basin from wellfield development of this magnitude. Records indicate that groundwater supplied to the City of Socorro is drawn from four wells ranging in depth from 97 to 505 feet. Well details and water levels are summarized in Table 5. Short-term pumping of the three highest capacity wells at rates between 740 and 850 gpm results in less than three feet of drawdown in any well. The specific capacities of these wells, based upon the data in Table 5, ranges from 180 to 410 gpm/ft. Specific capacities for three other wells utilizing the same aquifer system in the Socorro area were much lower than for the wells listed in Table 5. The National Guard Armory well was determined to have the lowest specific capacity at 5.8 gpm/ft (Summers et al, 1981). The replacement Bushman well on the NMIMT campus had a specific capacity of 14 gpm/ft (Summers and Schwab, 1983) while that of the City of Socorro Well Number 1 was estimated to be 39 gpm/ft (Summers, 1973).

Table 5
Summary of Well and Water Level Data for City of Socorro Wells

Date	Well Name	Total Depth (ft)	Static Water Level Depth (ft)	Time	Pumping Rate (gpm)	Pumping Water Level Depth (ft)	Time
4/10/1980	Eagle Picher	225	72.08[1]	07:48	~450	~130	10:00
8/25/1982	Industrial	505	263.9[2]	11:38	~10.6	264.4	12:00
7/7/1980	Olson	97	27.6[3]	10:59	~370	~33	11:59
9/24/1998	Eagle Picher	225	68	11:00	800	71	14:30
9/24/1998	School of Mines	197	29	12:00	850	31	14:00
9/24/1998	Industrial	505	261	13:30	820	264	15:00
9/24/1998	Olson	97	28	11:35	540	31	15:00
3/23/1999	Eagle Picher	225	68	08:15	800	71	09:15
3/23/1999	School of Mines	197	30	09:30	850	31.5	11:00
3/23/1999	Industrial	505	260	12:30	820	263	14:20
3/23/1999	Olson	97	28	11:35	540	31	15:00
11/1/2000	Eagle Picher	225	68	09:20	790	71	10:25
11/1/2000	School of Mines	197	30	10:35	820	31.5	11:40
11/1/2000	Industrial	505	256	11:50	820	258	13:00
7/17/2001	Eagle Picher	225	67	09:30	740	70	14:30
7/17/2001	School of Mines	197	30	10:05	820	32	13:45
7/17/2001	Industrial	505	260	10:37	820	262	13:25

[1]Data from Schwab, 1980a.
[2]Data from Schwab et al, 1982b
[3]Data from Schwab, 1980b

Anticipated future drawdown resulting from pumping in the City of Socorro well field can be estimated by utilizing the existing hydraulic data for wells in the Socorro field presented in Appendix C in conjunction with an equation relating discharge, aquifer properties and drawdown (Neuman, 1972). If we assume that all four wells listed in Table 5 operate at historical rates for the indefinite future, we can calculate the net effect of pumping at any point in the vicinity of the well field at any future point in time. For this report, the net change in aquifer water level was calculated for a hypothetical well located on the New Mexico Institute of Mining and Technology (NMIMT) golf course for periods of 20 and 40 years. The drawdown due to pumping from each well and the net drawdown at each point in time, in addition to the assumed hydraulic parameters and discharge rates, are summarized in Table 6. The net drawdown at the golf course is the sum of the estimated impacts of each individual well, according to the principal of superposition. Although this estimate assumes water is pumped from an infinite system, that no direct recharge from precipitation occurs, and that no interaction with surface water systems exists, it does provide what may be a reasonable first order range of anticipated impacts from well field operation. The existence of hydrogeologic barriers to groundwater flow will result in net drawdown that exceeds the estimates in Table 6; however, recharge from precipitation and seepage from surface water systems will have the effect of reducing the observed drawdown from the estimates shown in Table 6.

These calculations, while only a first-order approximation, suggest that for high efficiency wells drilled in the sand and gravel intervals, drawdown will not likely be a limiting factor in development. However, due to the proximity of these high producing zones to the river, relatively immediate stream depletions occur. Should pumping increase beyond present levels, additional depletions to the flow of the Rio Grande will occur that must be considered in balancing water supply conditions in the planning region.

Table 6
Estimated Future Drawdown from City of Socorro Well Field

Well	Distance from NMIMT Golf Course (ft)	T (ft^2/day)	S_y	Q (ft^3/day)	Drawdown (ft)	
					20 yrs	40 yrs
Eagle Picher	12,672	17,600	0.05	154,010	2.2	3.0
Olsen	4,013	28,000	0.235	103,957	1.4	1.6
Industrial	10,560	8,823	0.005	157,861	7.9	9.0
School of Mines	1,320	20,000	0.1	157,861	3.1	3.5
Net Drawdown at NMIMT Golf Course (ft)					**14.6**	**17.1**

3.4.2 Other Aquifers

Minor aquifers of limited extent occur in Tertiary volcanics and other bedrock formations. Little development presently occurs from these areas, although they do support numerous low yield domestic wells. Available data from these aquifers suggest that they could not support additional large-scale development. Storage and permeability of these aquifers are primarily associated with localized fracture porosity, which enhances transmissivity but provides limited aquifer storage. Data are unavailable to assess the drawdown from various levels of development in the Tertiary volcanics or other aquifers or the degree to which these units would be impacted by which development in the Upper Santa Fe Group.

4.0 LA JENCIA BASIN

The La Jencia Basin is located in central Socorro County (Figure 7) and is approximately 200 square miles in area. This section summarizes the physiography, geology and hydrogeology of the La Jencia Basin.

4.1 Physiography

The La Jencia Basin is a semi-closed basin lying west of the Rio Grande Basin in central Socorro County. It is bounded on north by the Colorado Plateau and the Ladron Mountains, on the west by Bear Mountains and on the south and west by the Magdalena Mountains (Anderholm, 1987). The La Jencia Basin is separated from the adjacent Socorro Basin by the Socorro Peak-Lemitar Mountains inter-graben horst, which acts as a hydraulic barrier that restricts groundwater flow between the basins. Elevations range from 5,000 feet in the northeast corner of the basin, where the Rio Salado flows toward the Rio Grande, to 6,400 feet along the Bear and Magdalena Mountain Ranges to the west. The climate is predominantly semi-arid. Mean precipitation in nearby Magdalena is 11.74 inches (Roybal, 1991).

Three streams drain surface water from La Jencia Basin. Both Bear Springs Canyon and La Jencia Creek drain water northward into the Rio Salado, which crosses the north edge of the basin. Water Canyon drains the southeastern part of La Jencia Basin. Surface water in this drainage runs eastward to the Rio Grande. However, none of these streams serve as perennial surface water drainage from this basin (Anderholm, 1983).

4.2 Geology

The geology of the La Jencia Basin is similar to that of the Rio Grande Basin described in the previous section. The basin floor is formed by asymmetrical groups of tilted fault blocks overlain by basin fill sediments (Figure 8). The planes of most faults flatten with depth and have normal offset.

Rocks of the Baca formation and Datil group overlie Mesozoic and Paleozoic rocks composed primarily of limestones, sandstones siltstones and shales. The Baca formation consists of conglomerates, red and white sandstones and shales while the Datil group is composed of as much as 2,000 feet of ash flow tuffs and volcanoclastic conglomerates and sandstones (Osburn and Chapin, 1983). The Datil Group outcrops along the eastern flank of the Bear Mountains and along La Jencia Creek in the central part of the La Jencia Basin.

Tertiary Socorro volcanics, estimated to be 20 to 33 million years old (Chapin and others, 1978), overlie the Datil Group and the Baca Formation. These rocks are made of ash – flow tuffs with andesite to basalt-andesite lavas, rhyolite lavas, rhyolite domes and landslide deposits. (Anderholm, 1987).

Overlying the Socorro volcanics are rocks of the Santa Fe Group. This formation has, as principal components, the Popotosa Formation, the Sierra Ladrones Formation and Quaternary deposits (Anderholm, 1987). The Popotosa Formation consists of a lower fanglomerate facies of red and brown conglomerates and sandstone and an upper playa facies. Thickness of the fanglomerate facies ranges from 2,700 to 6,200 feet while that of the playa facies ranges from 800 to 3,500 feet (Bruning 1973 as noted in Anderholm, 1987). The Sierra Ladrones Formation is composed primarily of alluvial fan, tributary alluvial and playa deposits. Playa deposits were formed after uplift of Socorro Peak and the Lemitar and Chupadera Mountains isolated La Jencia basin from the Socorro basin. Playa deposits consist of interbedded clays and silts and are confined to a small area in the basin center (Anderholm, 1987). Because the La Jencia Basin was disconnected from the Rio Grande Basin during deposition of the Sierra Ladrones Formation, the lithology of the Sierra Ladrones Formation more closely resembles that of the Popotosa Formation here than in the adjacent Socorro Basin (P. Johnson, 2001, personal communication).

4.3 Hydrogeology

Regional groundwater flow is generally to the north. Recharge to the groundwater system occurs as mountain front recharge, direct infiltration of precipitation and seepage from ephemeral streams in the basin. Groundwater discharge occurs as flow into surface water features such as La Jencia Creek, evapotranspiration by plants, and subsurface flow into the neighboring Rio Grande Basin.

4.3.1 Aquifer Properties

The principal aquifer in the La Jencia Basin consists of strata of the Santa Fe Group (Anderholm, 1987), although there are also wells that tap into the Tertiary volcanics along basin margins.

The Sierra Ladrones Formation comprises the uppermost aquifer in the La Jencia Basin. The coarse-grained fanglomerate facies in the underlying Popotosa Formation is also presumed to form a part of the principal aquifer system. Where present, the playa facies of the Popotosa Formation, which interfingers with the fanglomerate, is expected to act as a confining or low permeability unit. The Socorro volcanics and the group of rocks made of the Datil Group, the Baca Formation and underlying Mesozoic and Paleozoic rocks compose minor aquifers in the highlands around basin margins (Anderholm, 1987).

Although aquifer test results from the Sierra Ladrones Formation are not available, analysis of aquifer test data from wells that derive water from Quaternary deposits and the Upper Santa Fe Group in the adjacent Socorro Basin indicated an average hydraulic conductivity between 41 ft/d and 60 ft/d and a storativity ranging from 0.0002 to 0.23 (Hantush, 1961; USGS, 1979; Waldron, 1956). Calculations of transmissivity ranged from 3,700 ft^2/d to 27,000 ft^2/d (Hantush, 1961; Theis, 1938; Waldron, 1956). As discussed in Section 4.2, however, the lithology of this unit in the La Jencia Basin may differ from that in the Socorro Basin.

In the La Jencia Basin, aquifer tests using completed into the Tertiary volcanics wells in the Magdalena area, along the basin margin, were conducted by Bishop (1975) and Summers (1975). Bishop reported a transmissivity estimate of 160 ft^2/d based on tests on two wells. Summers tests yielded a transmissivity value of over 5,000 ft^2/d, although he mentions that the well is completed into a fault zone and the transmissivity of the formation as a whole is likely much lower.

In northern part of the basin, groundwater discharges to La Jencia Creek. Groundwater discharges to the Socorro Basin both in the Nogal Canyon-Snake Ranch Flats area and in the area of Socorro Canyon. The volume of groundwater flowing into the Socorro Basin is likely small in both localities. In Socorro Canyon, the Popotosa confining layer is exposed along most of the canyon and likely restricts groundwater flow in the area. In Nogal Canyon, the small thickness and width of permeable sediments limits groundwater flow.

Anderholm (1983 and 1987) suggested the possibility that significant ground water flow from La Jencia Basin into the Socorro Basin occurs beneath the Popotosa confining unit in the Socorro-Six Mile Canyon area. In this area, the Socorro Volcanics are likely heavily fractured and may provide a conduit for deep groundwater flow.

4.3.2 Well Data

The USGS provided records of 45 wells completed in the La Jencia Basin within the planning region. The target strata for most of these wells are not identified. It is assumed that the majority of water supply wells utilize the Upper Santa Fe Group Sierra Ladrones Formation as it forms the primary aquifer in the region. Of the eleven wells for which target unit is identified by the USGS, only one is completed into a water bearing unit older than the Santa Fe Group. Based upon well data provided by the USGS, well depths range from 44 to 540 feet, with an average depth of 235 feet.

4.3.3 Well Yield and Water Levels

Little data exist on well yields in the La Jencia Basin. Roybal (1991) reported one measured flow of 0.5 gpm. The yields of wells completed into the Upper Santa Fe Group in the adjacent Rio Grande Basin are commonly less than 50 gpm. Depth to water ranges from 10 feet to nearly 500 feet. In most locations the water table is more than 100 feet deep. Selected water-level measurements and generalized water table contours are shown on Figure 9.

4.3.4 Recharge

Recharge to groundwater systems in the La Jencia Basin occurs by direct infiltration of precipitation, infiltration of runoff from upland areas at basin margins, and seepage from ephemeral streams. Gross and Wilcox (1983) proposed that at least some of this recharge flows into the Socorro Mountain volcanic complex and discharges into the Rio Grande Basin at Socorro and Sedillo Springs. Based upon tritium isotope data, Gross and Wilcox concluded that recharge to the springs from the La Jencia Basin occurs in along two paths: (1) A local component derived from surface runoff from the Socorro Mountains or the Magdalena Mountains with a residence time of 4 years and (2) a regional pathway, with a residence time in excess of the 12.3 year half life of tritium, in which precipitation falling on the Magdalena Mountains travels through the Santa Fe Group into the fractured volcanics from which the springs discharge.

As discussed in the previous chapter, a number of methods can be used to quantify recharge, including direct estimation, water budget calculation, regression modeling, and water quality mixing studies. In this study, recharge to the La Jencia Basin was estimated using the Maxey-Eakin method (1949) as applied in the DBSA study and as described in the preceding chapter, and the Dewey-Hearne method as described and applied by Roybal (1991). These recharge estimates are summarized in Table 7. The estimate derived from Roybal (1991) and summarized in Table 8 includes 3,620 acre-ft from the Magdalena Mountains and one third of the 2,900 acre-ft from the Bear Mountains.

Table 7
Estimated Recharge (Yield) to La Jencia Basin
(acre-feet/year)

Method	Volumetric Recharge
Total Basin Yield by Maxey-Eakin	15,400
Mountain Front Recharge by Hearne-Dewey (Roybal, 1991)	4,600

In addition to the above estimates, Anderholm (1987) estimated mountain front recharge to the La Jencia Basin to be approximately 4,150 acre-ft/yr. The method used to obtain this estimate is not known.

As discussed in the preceding chapter on the Rio Grande Basin, the work presented in Anderholm (2001) suggests that both the Maxey-Eakin method and regression methods may significantly overestimate recharge rates.

4.3.5 Groundwater Resources

Given the small number of wells and the limited hydrologic data available for the La Jencia Basin, it is difficult to accurately quantify the volume of groundwater in storage in the basin. The feasibility of using these groundwater resources through long-term mining will be subject to constraints of cost, water quality and potential impacts to existing water users and surface water systems.

Despite these limitations, some use of stored groundwater may be feasible as part of a regional water plan. As discussed in the preceding chapter, this may take the form of water "banking" during years with above average precipitation and utilization during drought years. An estimate of the groundwater in storage that may be recoverable can be approximated using the same technique as was applied to the Rio Grande Basin. An assumed "recoverable" volume of aquifer that might be desaturated by pumping is multiplied by the specific yield of the aquifer. In the La Jencia Basin, the volume of usable groundwater in storage was estimated only for the Santa Fe Group. Even though data indicate that some wells utilize the Tertiary volcanics, in addition to the Santa Fe Group, as a groundwater source, the volcanics constitute only minor aquifers of limited extent. As discussed in Section 3.4.2, available data suggest that storage and permeability characteristics are primarily associated with localized fractures, which provide limited storage potential. Parameters used in the analysis and estimates of groundwater in storage are summarized in Table 8.

Table 8
Groundwater in Storage[1] - La Jencia Basin

Parameter	Santa Fe Group
Area (acres)	127,874
Thickness (feet)	10
Specific Yield	0.10
Groundwater Stored[2] (acre-feet)	127,874

[1] Upper 10 feet throughout study area
[2] The feasibility of recovering groundwater stored in this interval has not been evaluated

4.3.6 Water Quality

Anderholm (1987) presented data that indicates that water quality is good in the principal water bearing formations in the La Jencia Basin. Total dissolved solids concentrations are, for the most part, less than 300 mg/L. Lithology and flow distance have the largest effect on water quality. Precambrian and Paleozoic rocks have higher concentrations of calcium, carbonate and bicarbonate than the Tertiary volcanics and Santa Fe Group. Groundwater dissolves gypsum as it flows through the basin, resulting in dissolved sulfate concentrations increasing with distance from recharge areas.

4.4 <u>Groundwater Yields by Aquifer</u>

4.4.1 Principal Aquifer

Groundwater yields in the principal aquifer are described in this section. The principal water-bearing unit is the Santa Fe Group, which includes the Popotosa Formation and the overlying Sierra Ladrones Formation. As discussed in section 4.3.3, little data exists on well yields in the La Jencia Basin. Roybal (1991) reported one measured flow of 0.5 gpm. In the adjacent Rio Grande Basin, reported yields range from 0.5 to 2,700 gpm (Roybal, 1991), although nearly 70 percent of reported yields are less than 50 gpm.

4.4.1.1 <u>Sustainable yields</u>

As mentioned in the preceding chapter, the sustainable yield represents the amount of water that can be obtained over the indefinite future, or, in a steady-state condition. In some cases, sustainable yield has been equated to recharge. However, the recharge to the La Jencia Basin is currently being utilized to satisfy existing demands within the basin and in the adjacent Rio Grande Basin. Given that the La Jencia Basin is tributary to the Rio Grande, a careful evaluation of the impacts on existing uses would be required before implementation of additional groundwater withdrawals.

4.4.1.2 <u>Drawdown By Development</u>

The limited hydraulic parameter data in La Jencia Basin make uncertain any attempt to estimate drawdown by level of development. Current groundwater utilization appears to be primarily for domestic and stock uses. No data exist showing the relationship between drawdown and groundwater pumping or development.

4.4.2 Other Aquifers

As mentioned previously, there are wells within the study area that utilize the Tertiary volcanics and deeper Mesozoic and Paleozoic units for groundwater supplies. However, the number of wells in the La Jencia is small and hydrologic data are sparse. Data are unavailable to assess the sustainable yield or the drawdown from various levels of development in the Tertiary volcanics or other aquifers.

5.0 SUMMARY

In both the La Jencia and Rio Grande Basins, the principal aquifer system is the Santa Fe Group, which is composed of the Popotosa Formation, the Sierra Ladrones Formation, and Quaternary deposits. Groundwater generally moves toward the river from basin margins in the Rio Grande Basin, although there is a regional trend toward decreasing water level elevations from north to south along the length of the basin within the study area. In the La Jencia Basin, groundwater is found at depths in excess of 100 feet below ground surface and has been reported to discharge into the Rio Grande Basin in Nogal Canyon, Socorro Canyon and possibly though permeable material underlying Socorro-Six Mile Canyon.

Although little well data exist in the La Jencia Basin, a great deal of information is available for the Rio Grande Basin. The majority of wells within this basin target aquifers within the Quaternary alluvial deposits or the Sierra Ladrones Formation of the Santa Fe Group. Most wells yield less than 50 gpm, although capacities in excess of 2,000 gpm have been reported.

Recharge to the ground water systems in both basins occurs primarily through infiltration of precipitation and runoff from upland areas along basin margins. Mountain-front recharge has been estimated to be between 8,000 and 20,000 acre-feet/year for the Rio Grande Basin; and, basin yield, including surface tributary flow, may be as high as 63,000 acre feet per year in the planning region. In the La Jencia Basin, mountain-front recharge is estimated to be between 2,500 and 5,000 acre-feet/year; and, basin yield may be as high as 20,000 acre-feet per year. Basin recharge should not be viewed as an untapped supply of water for planning purposes. Basin recharge currently supplies existing uses and would be available to meet new needs only by shifting water for these uses.

For the most part, the surface and groundwater features within the Socorro-Sierra Planning Region are hydraulically connected. As a result, any assessment of the feasibility of developing groundwater resources as a part of a regional water plan must consider the role played by surface waters in the hydrologic system. Additional large-scale development of the groundwater resources in the Soccoro-Sierra Planning region will be limited due to depletions to the river system and the need to offset impacts to existing water rights. Pumping from some isolated, deep or remote areas may exhibit delayed impacts to the stream system; such areas may have potential utility for groundwater storage and recovery projects.

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Figure 1. Rio Grande Basin in the Study Area

City
Study Area & Sub-area divisions within the Rio Grande Basin
Drainage
Interstate
Geologic Cross Section
Reservoir

N
W E
S

0 10 20 Miles

S. S. Papadopulos & Associates, Inc.

Path S:/NM/692/APR/gw_wells.apr

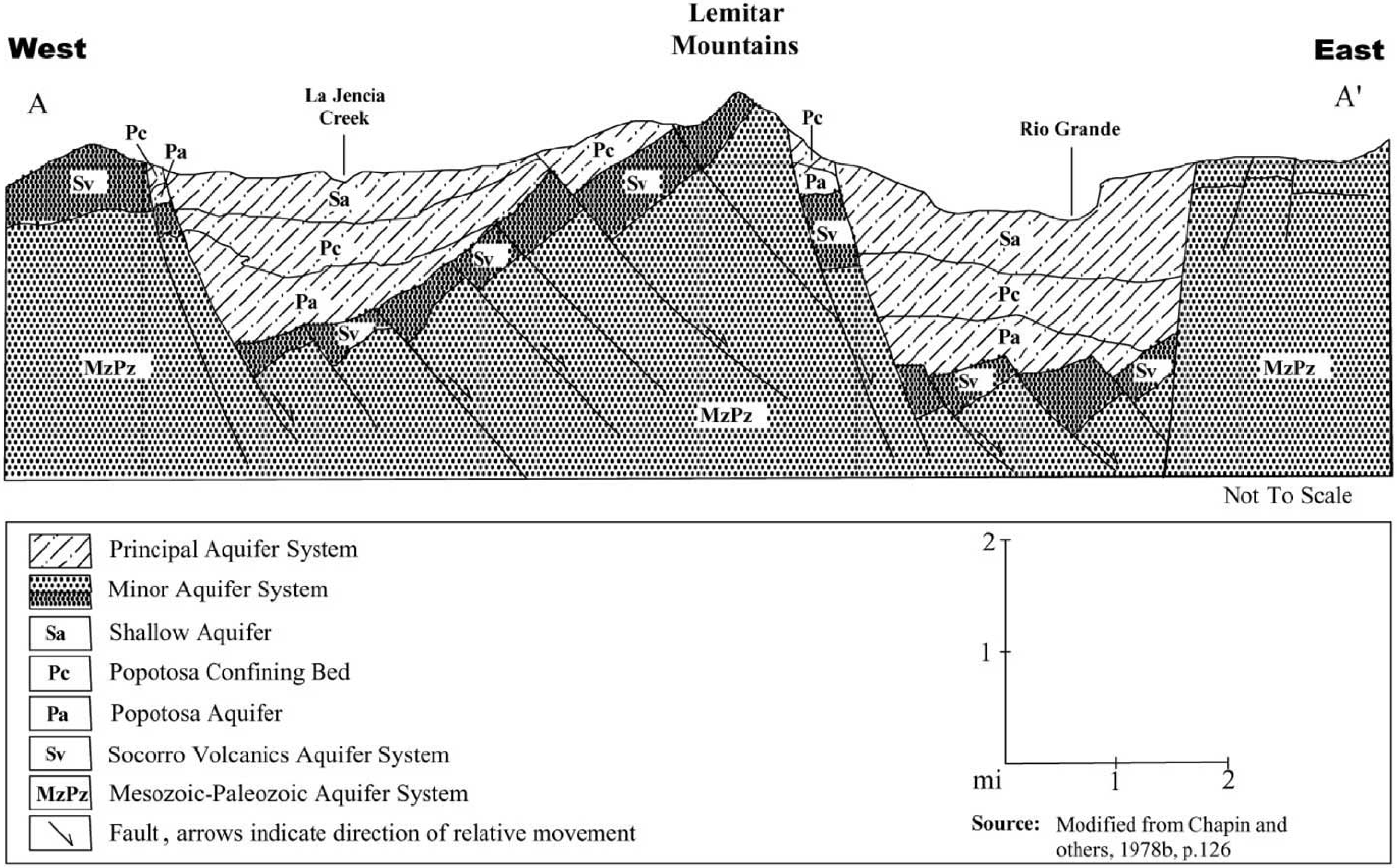

Figure 2. Cross Section A-A' through Rio Grande Basin

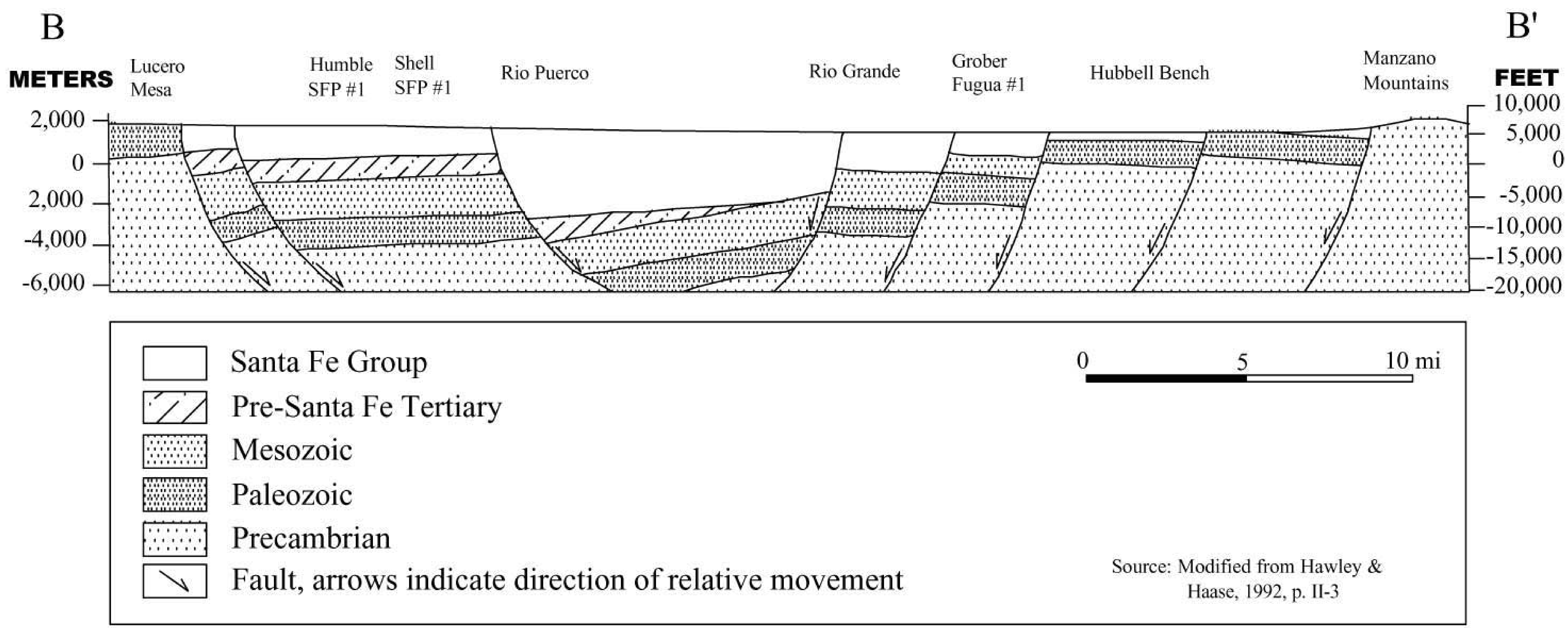

Figure 3. Cross Section B-B' through Rio Grande Basin

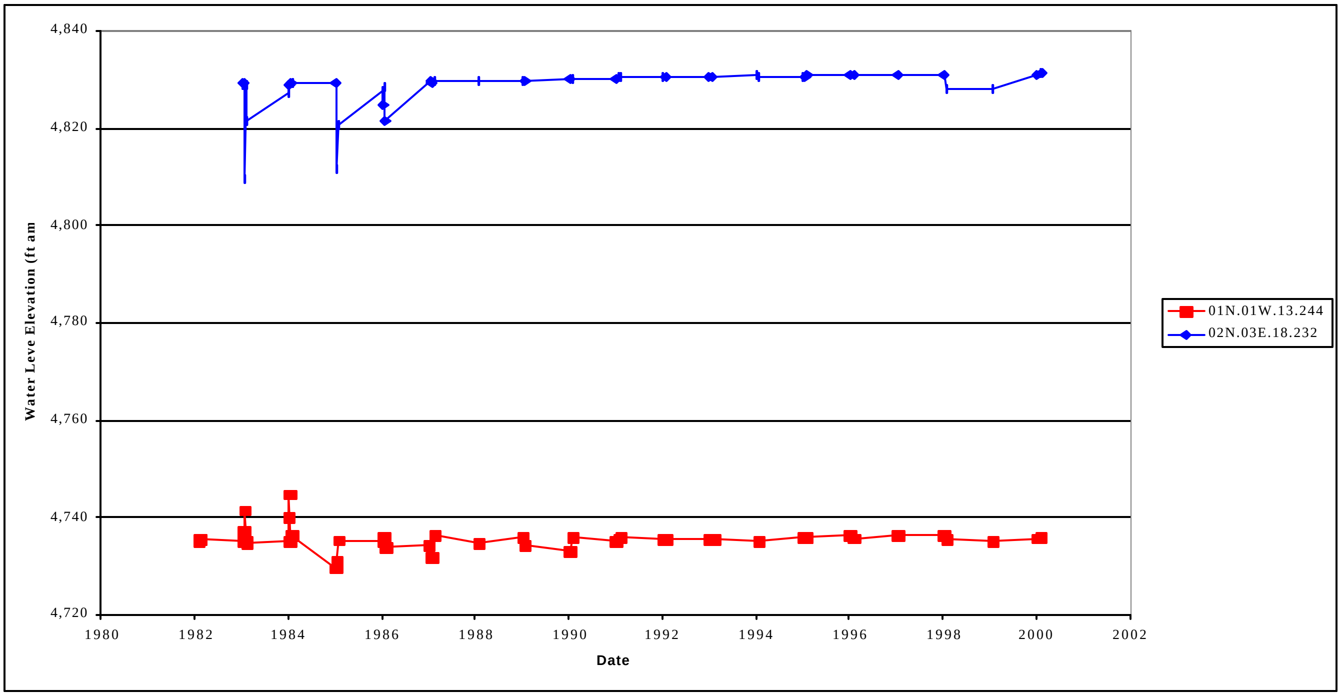

Figure 4 Hydrographs of Two Wells in the Rio Grande Basin near the Basin Margin

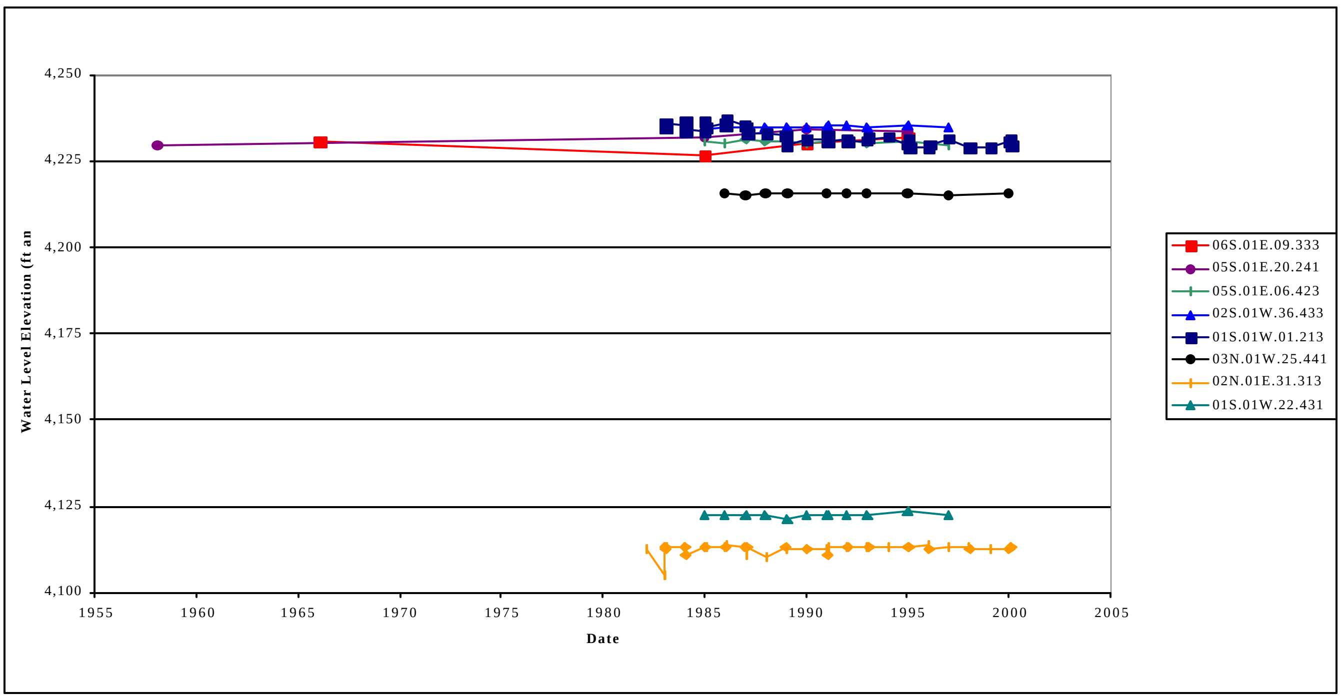

Figure 5 Hydrographs of Eight Wells in the Rio Grande Basin in the Inner Valley

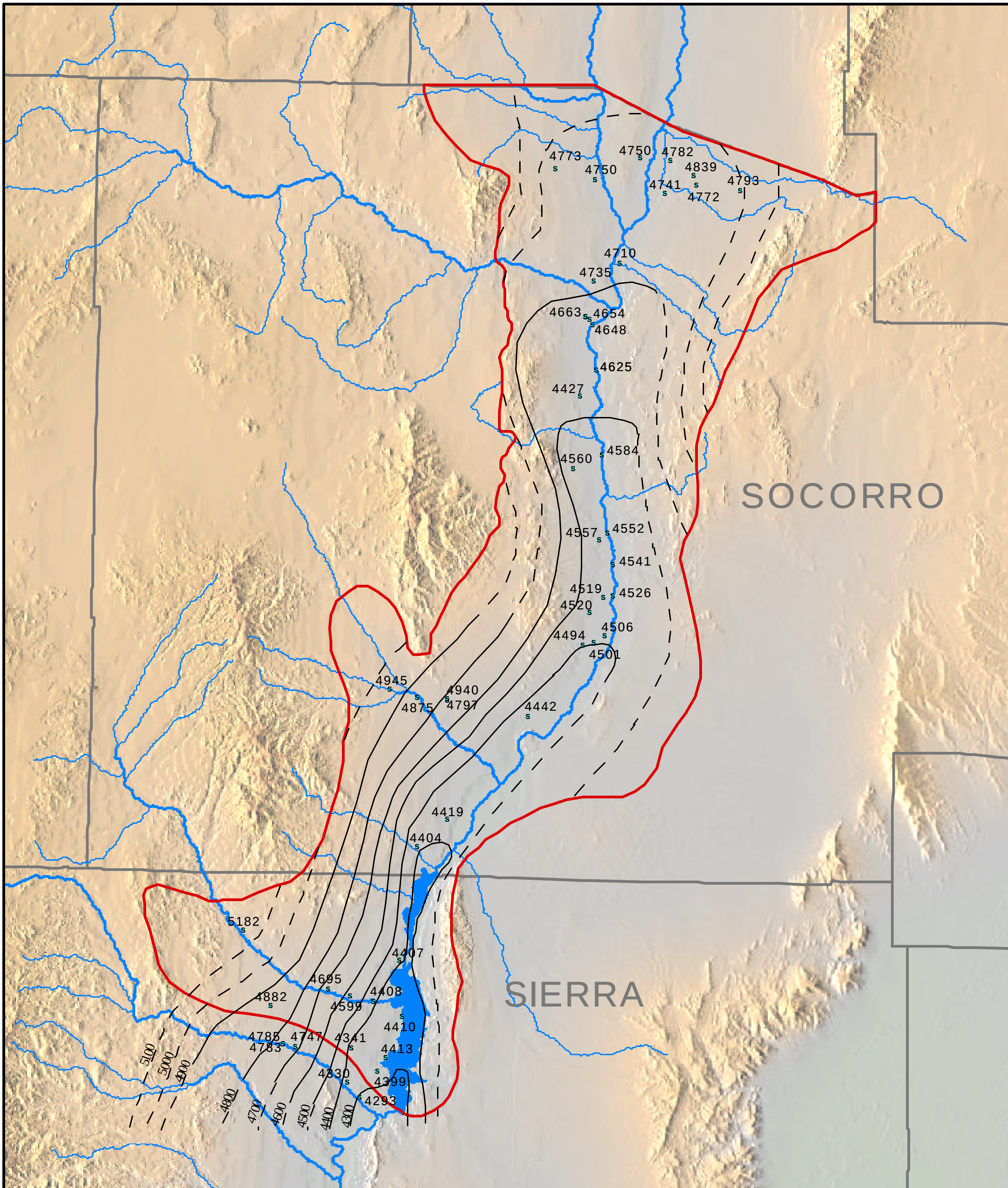

Figure 6. Water Table Map of the Rio Grande Basin in the Study Area

S Monitoring Well
4882 Water Level
Study Area within the Rio Grande Basin
Drainage
Groundwater Contour
Inferred Groundwater Contour

N
W E
S

0 5 10 15 Miles

Water Levels measured winter 1980-82.

Path S:/NM/692/APR/gw_wells.apr

S. S. Papadopulos & Associates, Inc.

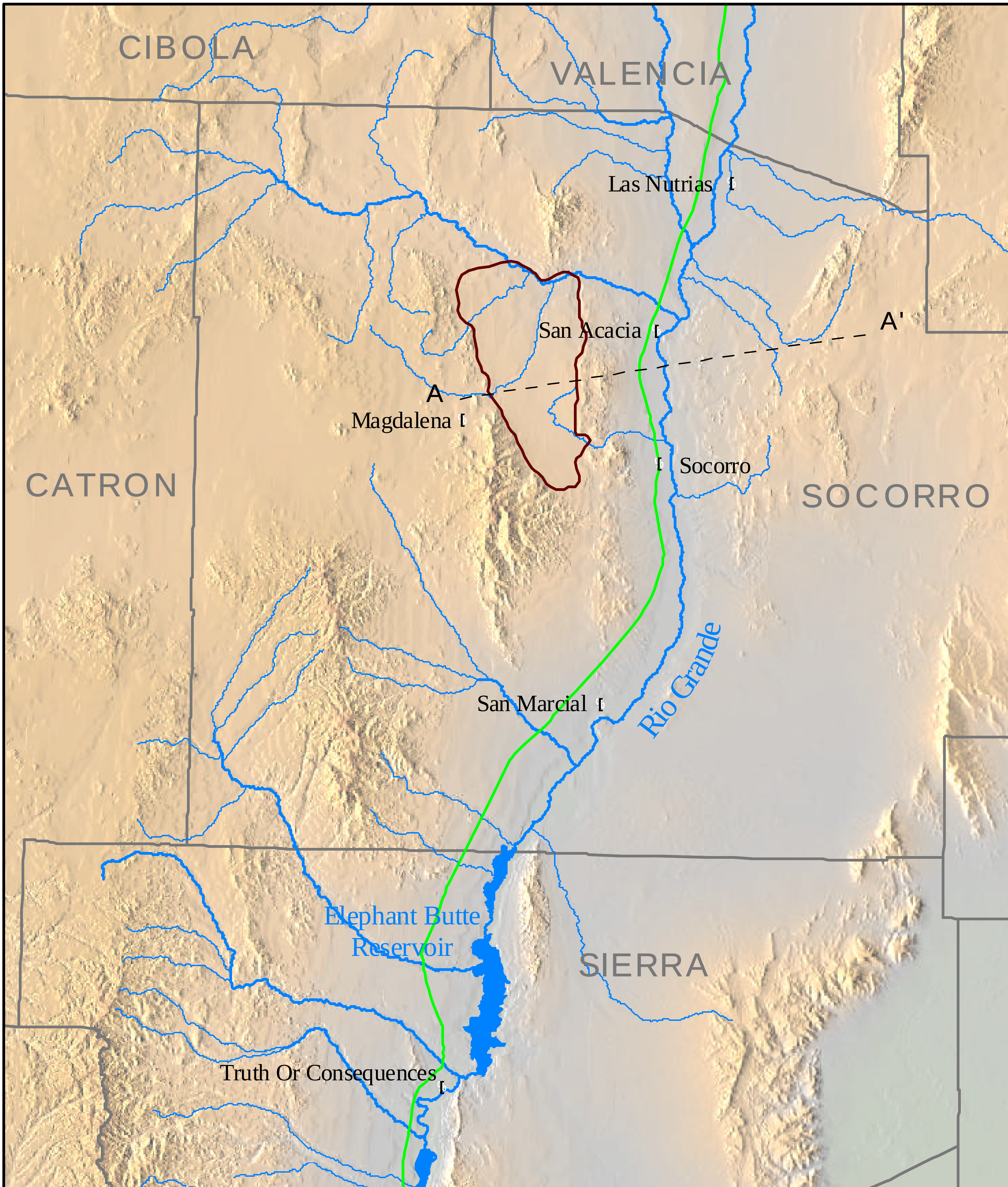

Figure 7. La Jencia Basin in Planning Region

City
La Jencia Basin
Drainage
Interstate
Geologic Cross Section
Reservoir

N W E S

0 10 20 Miles

S. S. Papadopulos & Associates, Inc.

Path S:/NM/692/APR/gw_wells.apr

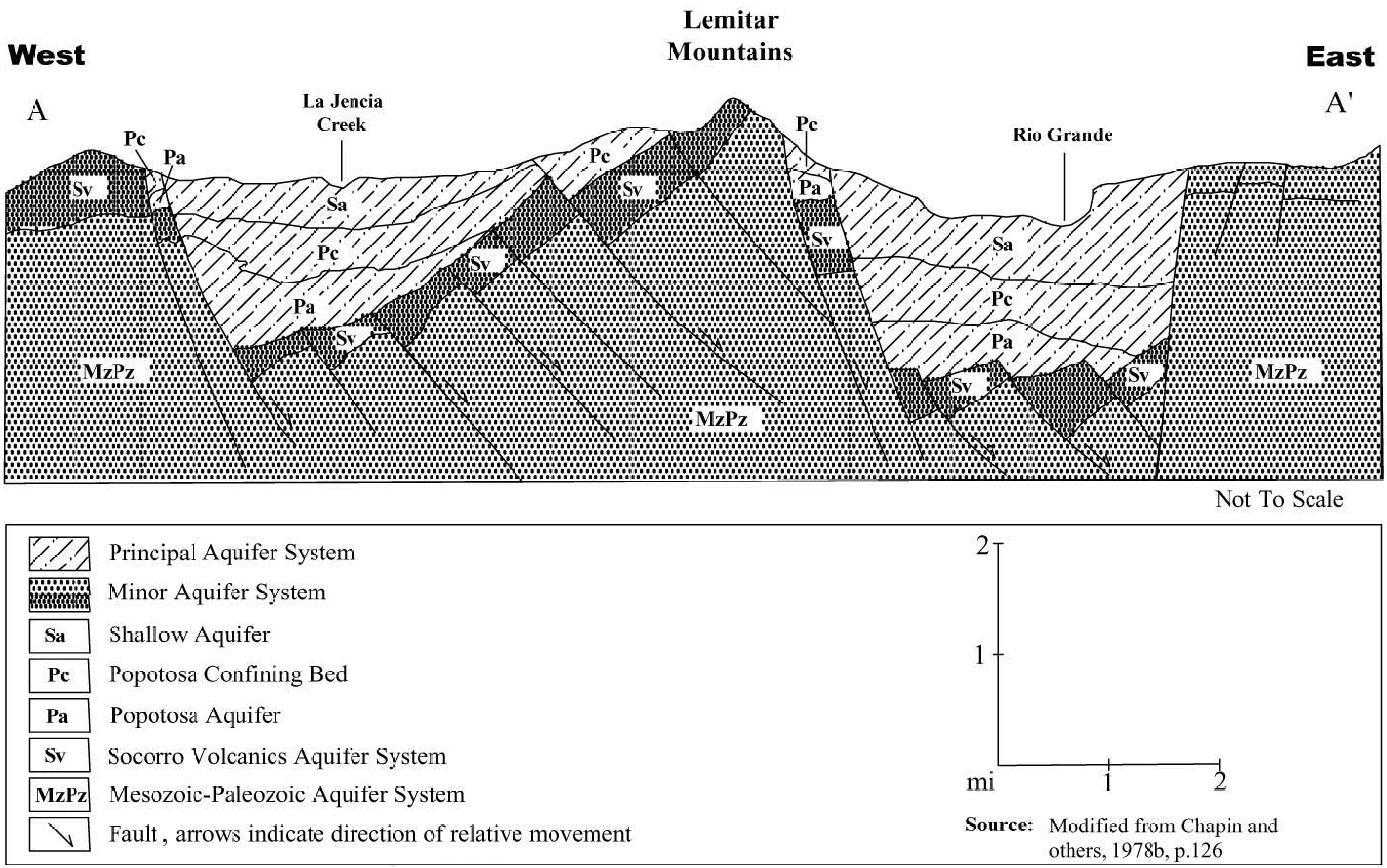

Figure 8. Cross Section A-A' through La Jencia Basin

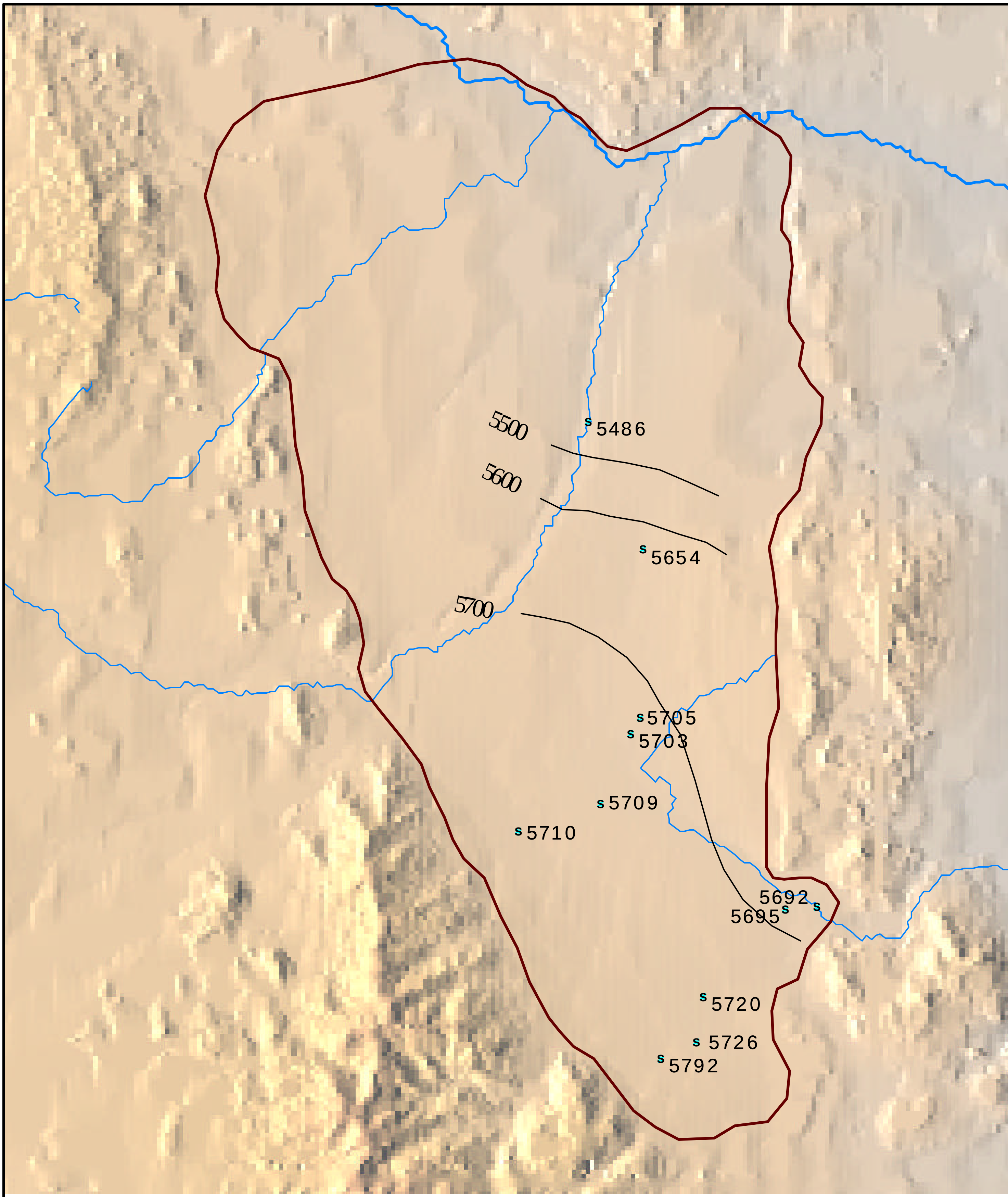

Figure 9. Water Levels in the La Jencia Basin

S Monitoring Well
5705 Water Level
La Jencia Basin
Drainage
Groundwater Contour

N
W E
S

0 2 4 Miles

Water Levels Measured June 1, 1960.

Path S:/NM/692/APR/gw_wells.apr

S. S. Papadopulos & Associates, Inc.

Appendix A

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Appendix B

Well and Water Level Data

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342041106504601	19950411	21.45	4246	4224.6	Rio Grande	89	01N.01E.04.123	34.344722	-106.8461	
342013106503901	19830726	20	6319	6299.0	Rio Grande	130	01N.01E.04.342	34.336944	-106.8442	5 to 10[b]
342048106515801			7350		Rio Grande		01N.01E.05.100	34.346667	-106.8661	
342031106551601	19850207	195.42	7320	7124.6	Rio Grande	220	01N.01W.02.133	34.3425	-106.9214	
342031106551601	19950209	192.75	6980	6787.3	Rio Grande	220	01N.01W.02.133	34.3425	-106.9214	
342031106551601	20000203		4690		Rio Grande	220	01N.01W.02.133	34.3425	-106.9214	
342023106555501	19850207	195.42	4560	4364.6	Rio Grande	220	01N.01W.03.144	34.339722	-106.9319	
342023106555501	19860114	194.34	4392.5	4198.2	Rio Grande	220	01N.01W.03.144	34.339722	-106.9319	
342032106551601	19490817	25	4610	4585.0	Rio Grande		01N.01W.03.420	34.342222	-106.9211	
341839106531601	19760903	167.7	4600	4432.3	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19820806	164.81	4600	4435.2	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19821021	164.68	4600	4435.3	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19821118	164.44			Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19821216	164.58	4394.4	4229.8	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19830224	164.85	4394.4	4229.6	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19830330	164.69	4394.4	4229.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19830531	162.74	4398.8	4236.1	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19830630	158.51	4398.8	4240.3	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19831007	164.93	4398.8	4233.9	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19831027	165.15	4401	4235.9	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19840131	164.9	4401	4236.1	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19840224	159.92	4401	4241.1	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19840312	155.23	4403.9	4248.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19840504	164.6	4403.9	4239.3	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19840614	164.72	4403.9	4239.2	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19840731	163.75	4409.1	4245.4	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19850228	170.46	4409.1	4238.6	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19850423	169.07	4409.1	4240.0	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19850905	164.69	4475	4310.3	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19860129	164.8	6150	5985.2	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19860402	163.98	4790	4626.0	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19860609	165.3	4790	4624.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19860801	165.98	4621	4455.0	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	

[a]Negative depth to water indicates water level above land surface datum

[b]Roybal (1991)

[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341839106531601	19870123	165.79	4598	4432.2	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19870630	168.26	5660	5491.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19871230	163.78	5640	5476.2	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19880726	165.43	5610	5444.6	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19890130	164.11	5860	5695.9	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19890707	165.89	5560	5394.1	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19900209	166.92	5560	5393.1	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19900706	164.04	5550	5386.0	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19910103	164.91	5550	5385.1	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19910702	164.24	5425	5260.8	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19911002	164.07	5445	5280.9	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19920109	164.37	5440	5275.6	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19920714	164.38	5350	5185.6	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19930112	164.5	5335	5170.5	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19930630	164.35	5335	5170.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19931230	164.39	5350	5185.6	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19940630	164.88	5550	5385.1	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19950120	164.16	5240	5075.8	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19950629	164.27	5240	5075.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19951031	164.08	5240	5075.9	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19960125	163.6	5259	5095.4	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19960924	164.28	5242	5077.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19970429	163.7	5238	5074.3	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19980212	163.48	5238	5074.5	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19980729	164.55	5222	5057.5	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	19990720	164.71	5222	5057.3	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	20000210	164.27	5230	5065.7	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341839106531601	20000823	164.08	5230	5065.9	Rio Grande	212	01N.01W.13.244	34.310833	-106.8878	
341817106552601	19800529	12.52	5230	5217.5	Rio Grande	20	01N.01W.15.443	34.304722	-106.9239	
341817106552601	19820806	12.04	6842	6830.0	Rio Grande	20	01N.01W.15.443	34.304722	-106.9239	
341817106552601	19850207	9.63	6860	6850.4	Rio Grande	20	01N.01W.15.443	34.304722	-106.9239	
341817106552601	19900124	10.24	7521	7510.8	Rio Grande	20	01N.01W.15.443	34.304722	-106.9239	
341817106552601	19950209	10.71	6600	6589.3	Rio Grande	20	01N.01W.15.443	34.304722	-106.9239	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for
La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341817106552601	20000203	9.75	6580	6570.3	Rio Grande	20	01N.01W.15.443	34.304722	-106.9239	
341854106574701	19500114	13.32	6553	6539.7	Rio Grande		01N.01W.17.210	34.315	-106.9631	2.5[b]
341640106581001			6518		Rio Grande		01N.01W.22.220	34.277778	-106.9694	
341532106550001	19500115	117.3	6915	6797.7	Rio Grande		01N.01W.34.334	34.261944	-106.9367	
341540106540001	19820806	6.51	6480	6473.5	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19821021	6.44	6715	6708.6	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19830127	6.54	6824	6817.5	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19830224	6.6	4460	4453.4	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19830330	6.54	4533	4526.5	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19830426	6.32	4880	4873.7	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19830531	6.46	4690	4683.5	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19830630	6.72	4690	4683.3	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19830801	6.92	4690	4683.1	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19831007	7.11	4685	4677.9	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19831027	7.1	4685	4677.9	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19831201	6.92	4685	4678.1	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840131	6.86	4642	4635.1	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840224	6.87	4632	4625.1	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840313	6.86	4625	4618.1	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840326	6.3	4625	4618.7	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840430	6.45	4625	4618.6	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840611	6.11	5283	5276.9	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840730	6.99	4805	4798.0	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19840828	6.89	4810	4803.1	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19850228	7.7	4810	4802.3	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540001	19850423	6.4	4810	4803.6	Rio Grande	59	01N.01W.36.334	34.261111	-106.9	
341540106540002	19820806	-0.7	4795	4795.7	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19821021	-0.79	4800	4800.8	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19821216	-1.01	4800	4801.0	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19830127	-1.2	4800	4801.2	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19830224	-1.22	4990	4991.2	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19830330	-1.11	4800	4801.1	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19830426	-1	4800	4801.0	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341540106540002	19830531	-0.82	4800	4800.8	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19830630	-0.73	4740	4740.7	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19831007	0.96	5205	5204.0	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19831027	1.01	5160	5159.0	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19831202	-0.88	5140	5140.9	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19840131	-0.9	5120	5120.9	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19840313	-1.6	5120	5121.6	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19840611	-1.6	5110	5111.6	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19840730	-1.38	5590	5591.4	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19840828	-0.91	5580	5580.9	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19850228	-1.21	6355	6356.2	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540002	19850423	-1.06	4459	4460.1	Rio Grande	25	01N.01W.36.334A	34.261111	-106.9	
341540106540003	19820806	5.42	4490	4484.6	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19821021	5.66	4518	4512.3	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19821216	5.89	4512	4506.1	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19830127	5.81	4680	4674.2	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19830224	5.99	4821	4815.0	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19830330	5.77	4808	4802.2	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19830426	5.64	4808	4802.4	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19830531	5.97	4800	4794.0	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19830630	6.12	4502	4495.9	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19830801	6.13	5057	5050.9	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19831007	6.53	5182	5175.5	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19831027	6.65	4795	4788.4	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19831202	6.4	4740	4733.6	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19840131	6.08	4835	4828.9	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19840224	5.59	4795	4789.4	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19840313	6.36	4795	4788.6	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19840430	5.96	4839	4833.0	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19840611	5.61	4837	4831.4	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19840730	6.19	4837	4830.8	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19840828	6.22	4795	4788.8	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540003	19850228	6.63	4840	4833.4	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
341540106540003	19850423	5.9	5710	5704.1	Rio Grande	62	01N.01W.36.334B	34.261111	-106.9	
341540106540004	19820806	5.57	5820	5814.4	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19821021	5.79	4857	4851.2	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19821216	6.04	4857	4851.0	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19830127	5.97	4857	4851.0	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19830224	6.11	4415	4408.9	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19830330	5.95	4510	4504.1	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19830426	5.77	4510	4504.2	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19830531	6.13	4510	4503.9	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19830630	6.22	4510	4503.8	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19830801	6.39	4455	4448.6	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19831007	6.67	4555	4548.3	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19831027	6.79	4519	4512.2	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19831202	6.57	4519	4512.4	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19840131	6.44	4242	4235.6	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19840224	6.58	4600	4593.4	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19840313	6.52	4340	4333.5	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19840430	6.09	4410	4403.9	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19840611	5.78	4410	4404.2	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19840730	6.81	4410	4403.2	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19840828	4.37	4410	4405.6	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19850228	6.78	4410	4403.2	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540004	19850423	6.03	4410	4404.0	Rio Grande	25	01N.01W.36.334C	34.261111	-106.9	
341540106540005	19820806	5.27	4410	4404.7	Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19821021		4410		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19821216	5.93	4410	4404.1	Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19830224	6	4410	4404.0	Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19830330	5.83	4562	4556.2	Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19830426	5.63	4560	4554.4	Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19830531		4560		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19830630		4540		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19830801		4505		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19831007		4490		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
341540106540005	19831027		4510		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19831202		4460		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19840131		4415		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19840224		4600		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19840313		4438		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19840611		4410		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19840730		4430		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19840828		4430		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19850228		4430		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540005	19850423		4358		Rio Grande	10	01N.01W.36.334D	34.261111	-106.9	
341540106540006	19820806	5.54	4350	4344.5	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19821021	5.81	4350	4344.2	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19830127	5.98	4355	4349.0	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19830224	6.16	4355	4348.8	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19830330	5.95	4355	4349.1	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19830426	5.8	4355	4349.2	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19830531	6.17	4355	4348.8	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19830630	6.27	4355	4348.7	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19830801	6.45	4355	4348.6	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19831007	6.71	4355	4348.3	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19831027	6.77	4355	4348.2	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19831202	6.65	4355	4348.4	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19840131	6.58	4355	4348.4	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19840224	6.63	4355	4348.4	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19840313	6.45	4355	4348.6	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19840430	5.54	4355	4349.5	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19840611	5.82	4355	4349.2	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19840730	6.53	4355	4348.5	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19840828	6.34	4355	4348.7	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19850228	6.82	4355	4348.2	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540006	19850423	6.07	4355	4348.9	Rio Grande	50	01N.01W.36.334E	34.261111	-106.9	
341540106540011	19820806	5.59	4355	4349.4	Rio Grande	8.5	01N.01W.36.334F	34.261111	-106.9	
341540106540011	19850423		4355		Rio Grande	8.5	01N.01W.36.334F	34.261111	-106.9	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341540106540012	19820806	5.59	4355	4349.4	Rio Grande	8	01N.01W.36.334G	34.261111	-106.9	
341540106540012	19821021	5.65	4355	4349.4	Rio Grande	8	01N.01W.36.334G	34.261111	-106.9	
341540106540012	19850423	6.39	4355	4348.6	Rio Grande	8	01N.01W.36.334G	34.261111	-106.9	
341540106540013	19821021	6.74	4355	4348.3	Rio Grande	24.5	01N.01W.36.334H	34.261111	-106.9	
341540106540013	19850423	6.97	4355	4348.0	Rio Grande	24.5	01N.01W.36.334H	34.261111	-106.9	
341540106540014	19820806	4.86	4355	4350.1	Rio Grande	6.2	01N.01W.36.334I	34.261111	-106.9	
341540106540014	19850423		4355		Rio Grande	6.2	01N.01W.36.334I	34.261111	-106.9	
341540106540015	19821021	6.02	4355	4349.0	Rio Grande	8.2	01N.01W.36.334J	34.261111	-106.9	
341540106540016	19821021	5.91	4355	4349.1	Rio Grande	22.6	01N.01W.36.334K	34.261111	-106.9	
341540106540016	19850423	6.17	4355	4348.8	Rio Grande	22.6	01N.01W.36.334K	34.261111	-106.9	
341540106540017			4355		Rio Grande	100	01N.01W.36.334P	34.261111	-106.9	
341842106425401			4355		Rio Grande		01N.02E.15.223	34.311667	-106.715	
341811106440401	19500124	63.74	4355	4291.3	Rio Grande	100	01N.02E.21.120	34.303056	-106.7344	
341605106434202			4355		Rio Grande		01N.02E.34.130	34.268056	-106.7283	
341605106434201	19850131	32.44	4355	4322.6	Rio Grande		01N.02E.34.1331	34.268056	-106.7283	
341605106434201	19900124	32.82	4355	4322.2	Rio Grande		01N.02E.34.1331	34.268056	-106.7283	
341612106434101	19500124	32	4355	4323.0	Rio Grande	100	01N.02E.34.310	34.27	-106.7281	
341845106575801	19491130	9.93	4355	4345.1	Rio Grande		01N.02W.01.330	34.333333	-107.0111	
341940107053501			4355		La Jencia		01N.02W.07.132	34.327778	-107.0931	
342045106370701	19490726	114.65	4355	4240.4	Rio Grande		01N.03E.03.120	34.345833	-106.6186	
341823106370201			4355		Rio Grande		01N.03E.15.340	34.306389	-106.6172	
341535106382601	19850131	50.84	4355	4304.2	Rio Grande	55	01N.03E.32.444	34.259722	-106.6406	
341535106382601	19900124	44.7	4350	4305.3	Rio Grande	55	01N.03E.32.444	34.259722	-106.6406	
341535106382601	20000204	41.52	4360	4318.5	Rio Grande	55	01N.03E.32.444	34.259722	-106.6406	
341559106381201	19640625	20	4342	4322.0	Rio Grande		01N.03E.33.	34.266389	-106.6367	
341917107113901			4320		La Jencia		01N.03W.07.342 CARBON SP	34.321389	-107.1942	
341959106302001	19490822	136.1	4320	4183.9			01N.04E.03.444	34.333056	-106.5056	
341953106305001	19490822	145	4320	4175.0			01N.04E.10.121	34.331389	-106.5139	
341952106271001	19210101	118	4338	4220.0		163	01N.04E.11.244	34.331111	-106.4528	
341836106295701	19490831	68.63	4422	4353.4			01N.04E.14.113	34.31	-106.4992	
341647106285701	19491116	141.39	4310	4168.6			01N.04E.25.314	34.279722	-106.4825	
341647106324001	19490831	154.5				180	01N.04E.29.413	34.279722	-106.5444	
341544106292601	19490802	98.5	4345	4246.5			01N.04E.35.434	34.262222	-106.4906	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341608106284301			4334				01N.04E.36.140	34.268889	-106.4786	
341733107121101			4345		La Jencia		01N.04W.24.442	34.2925	-107.2031	
341925106280001	19491116	137.2	4340	4202.8			01N.05E.07.311	34.323611	-106.4667	
342015107263201			4375				01N.06W.02.213	34.3375	-107.4422	
342015107264301			4357				01N.06W.03.244	34.3375	-107.4453	
342015107265001			4255				01N.06W.03.424	34.3375	-107.4472	
342042107292501	19850918	171.27				275	01N.06W.06.224	34.345	-107.4903	
342036107295401	19850918	173.75				206	01N.06W.06.244	34.343333	-107.4983	
341948107295001	19750812	280	4762	4482.0		627	01N.06W.08.113	34.33	-107.4972	21[b]
341948107295001	19850918	304.11	4410	4105.9		627	01N.06W.08.113	34.33	-107.4972	
341929107265801			4280				01N.06W.10.421	34.324722	-107.4494	
341859107251201			4250				01N.06W.13.221	34.316389	-107.42	
341814107263601			4242				01N.06W.14.334	34.303889	-107.4433	
341838107303401	19750812	60.3	4242	4181.7			01N.06W.18.321	34.310556	-107.5094	
341812107282201	19750812	61.49	4242	4180.5			01N.06W.21.122	34.303333	-107.4728	
341745107265801			4242				01N.06W.22.421	34.295833	-107.4494	
341809107253001	19750812	8.88	4242	4233.1			01N.06W.24.122	34.3025	-107.425	
341751107430201	19771215	386.58	4242	3855.4			01N.08W.19.14421	34.2975	-107.7172	
341734107382901	19790419	352.34	4242	3889.7			01N.08W.23.42331	34.292778	-107.6414	
341704107404401	19790419	425.1	4242	3816.9			01N.08W.28.232	34.284444	-107.6789	
341611107381601	19771215	236.53	4242	4005.5			01N.08W.35.123111	34.269722	-107.6378	
341611107381601	19790214	236.81	4242	4005.2			01N.08W.35.123111	34.269722	-107.6378	
341611107381601	19800116	237.44	4242	4004.6			01N.08W.35.123111	34.269722	-107.6378	
341611107381601	19800923	239.68	4242	4002.3			01N.08W.35.123111	34.269722	-107.6378	
341611107381601	19810316	237.19	4242	4004.8			01N.08W.35.123111	34.269722	-107.6378	
341611107381601	19900130		4242				01N.08W.35.123111	34.269722	-107.6378	
341611107381601	19910211	218.42	4242	4023.6			01N.08W.35.123111	34.269722	-107.6378	
341611107381601	20010206	239.64	4242	4002.4			01N.08W.35.123111	34.269722	-107.6378	
341552107384501	19771215	239.27	4242	4002.7			01N.08W.35.224111	34.264444	-107.6458	
341552107384501	19790214	239.55	4242	4002.5			01N.08W.35.224111	34.264444	-107.6458	
341552107384501	19800116	240.23	4242	4001.8			01N.08W.35.224111	34.264444	-107.6458	
341552107384501	19800923	242.57	4242	3999.4			01N.08W.35.224111	34.264444	-107.6458	
341552107384501	19810316	239.94	4242	4002.1			01N.08W.35.224111	34.264444	-107.6458	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341552107384501	19900130	240.82	4242	4001.2			01N.08W.35.224111	34.264444	-107.6458	
341545107384801	19771215	238.05	4242	4004.0			01N.08W.35.324221	34.2625	-107.6467	
341545107384801	19790214	238.37	4242	4003.6			01N.08W.35.324221	34.2625	-107.6467	
341545107384801	19800116	238.92	4242	4003.1			01N.08W.35.324221	34.2625	-107.6467	
341545107384801	19800923	240.85	4242	4001.2			01N.08W.35.324221	34.2625	-107.6467	
341545107384801	19810316	238.72	4242	4003.3			01N.08W.35.324221	34.2625	-107.6467	
341545107384801	19900130	233.89	4242	4008.1			01N.08W.35.324221	34.2625	-107.6467	
341545107384801	19910211	238.63	4242	4003.4			01N.08W.35.324221	34.2625	-107.6467	
341545107384801	19960208	238.67	4242	4003.3			01N.08W.35.324221	34.2625	-107.6467	
341547107375401	19771215	218.36	4242	4023.6			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	19790214	217.36	4242	4024.6			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	19800116	217.89	4242	4024.1			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	19800923	220.14	4242	4021.9			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	19810316	217.66	4242	4024.3			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	19900130	218.69	4242	4023.3			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	19910211	216.99	4242	4025.0			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	19960208	217.34	4242	4024.7			01N.08W.36.323113	34.263056	-107.6317	
341547107375401	20010206	218.42	4242	4023.6			01N.08W.36.323113	34.263056	-107.6317	
341444106472501	19500126	122.24	4242	4119.8	Rio Grande		01S.01E.01.430	34.245556	-106.7903	
341430106525801	19760831	60	4242	4182.0	Rio Grande	100	01S.01E.07.123	34.241667	-106.8828	30[b]
341410106503401	19500222	351	4242	3891.0	Rio Grande		01S.01E.09.410	34.236111	-106.8428	
341221106490301			4242		Rio Grande		01S.01E.23.313	34.205833	-106.8175	
341109106470901	19500518	35	4242	4207.0	Rio Grande	145	01S.01E.36.220	34.185833	-106.7858	50[b]
341519106535101	19950417	11.6	4242	4230.4	Rio Grande	65	01S.01W.01.124	34.255278	-106.8975	
341528106533301	19830224	6.18	4242	4235.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19830426	5.83	4242	4236.2	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19830531	6.39	4242	4235.6	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19830630	6.52	4242	4235.5	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19830801	7.31	4242	4234.7	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19831007	7.33	4242	4234.7	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19831027	7.55	4242	4234.5	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19831202	5.85	4242	4236.2	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19840131	6.49	4242	4235.5	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341528106533301	19840224	6.62	4242	4235.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19840313	6.47	4242	4235.5	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19840430	6.8	4242	4235.2	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19840611	5.27	4242	4236.7	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19840730	8.15	4242	4233.9	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19840828	7.67	4242	4234.3	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19850228	8.64	4242	4233.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19850423	5.58	4242	4236.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19850905	7.44	4242	4234.6	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19860129	5.97	4242	4236.0	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19860609	6.94	4242	4235.1	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19860801	5.09	4242	4236.9	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19870123	6.63	4242	4235.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19870630	6.96	4242	4235.0	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19870730	7.07	4242	4234.9	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19871230	8.83	4242	4233.2	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19880726	9.18	4242	4232.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19890130	9.5	4242	4232.5	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19890707	12.21	4242	4229.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19900209	10.4	4242	4231.6	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19900706	10.75	4242	4231.3	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19910103	10.79	4242	4231.2	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19910109	10.56	4242	4231.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19910702	9.78	4242	4232.2	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19910714	11.17	4242	4230.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19911002	11.22	4242	4230.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19920109	10.56	4242	4231.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19920714	11.17	4242	4230.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19930112	11	4242	4231.0	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19930630	10.22	4242	4231.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19931230	10.4	4242	4231.6	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19940630	9.85	4242	4232.2	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19950120	12.17	4242	4229.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341528106533301	19950629	10.59	4242	4231.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19951031	13.11	4242	4228.9	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19960125	13.01	4242	4229.0	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19960924	12.18	4242	4229.8	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19970429	10.43	4242	4231.6	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19980212	12.99	4242	4229.0	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19980729	12.89	4242	4229.1	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	19990720	13.03	4242	4229.0	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	20000210	11.26	4242	4230.7	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	20000823	10.94	4242	4231.1	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341528106533301	20001211	12.59	4242	4229.4	Rio Grande	38	01S.01W.01.213	34.257778	-106.8925	
341514106534801	19560522	6.89	4242	4235.1	Rio Grande	50	01S.01W.01.231	34.253889	-106.8967	
341435106545701			4242		Rio Grande		01S.01W.02.123	34.243056	-106.9158	
341301106550701			4242		Rio Grande		01S.01W.14.334	34.216944	-106.9186	
341308106550901			4242		Rio Grande		01S.01W.14.431	34.218889	-106.9192	
341247106560501	19580120	47	4242	4195.0	Rio Grande	104	01S.01W.22.243	34.213056	-106.9347	200[b]
341225106555501			4242		Rio Grande		01S.01W.22.324	34.206944	-106.9319	
341211106560001	19760804	95	4242	4147.0	Rio Grande	125	01S.01W.22.340	34.203056	-106.9333	
341219106554901	19850129	119.62	4242	4122.4	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	1200[b]
341219106554901	19860113	119.44	4242	4122.6	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19870319	119.7	4242	4122.3	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19880115	119.35	4242	4122.7	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19890921	120.85	4242	4121.2	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19900130	119.39	4242	4122.6	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19910208	119.36	4242	4122.6	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19910717	119.45	4242	4122.6	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19920206	119.25	4242	4122.8	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19930202	119.4	4242	4122.6	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19950214	118.63	4242	4123.4	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341219106554901	19970128	119.68	4242	4122.3	Rio Grande	140	01S.01W.22.431	34.205278	-106.9303	
341255106545501			4242		Rio Grande		01S.01W.23.122	34.215278	-106.9153	
341242106544801			4242		Rio Grande	75	01S.01W.23.231	34.211667	-106.9133	
341222106550501			4242		Rio Grande		01S.01W.23.300	34.206111	-106.9181	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341230106551201			4241		Rio Grande		01S.01W.23.311	34.208333	-106.92	
341215106551201			4242		Rio Grande		01S.01W.23.331B	34.204167	-106.92	
341210106551501			4242		Rio Grande		01S.01W.23.333	34.202778	-106.9208	
341222106543501	19510101	8	4242	4234.0	Rio Grande	100	01S.01W.23.431	34.206111	-106.9097	
341210106542501			4242		Rio Grande		01S.01W.23.444	34.202778	-106.9069	1035[c]
341154106540001			4242		Rio Grande		01S.01W.25.100	34.198333	-106.9	
341155106540601	19570416	10	4242	4232.0	Rio Grande	100	01S.01W.25.114	34.198611	-106.9017	
341124106540501	19520601	9	4242	4233.0	Rio Grande	150	01S.01W.25.332	34.19	-106.9014	
341151106551001	19580501	40	4242	4202.0	Rio Grande	80	01S.01W.26.131	34.1975	-106.9194	
341153106543001			4242		Rio Grande		01S.01W.26.200	34.198056	-106.9083	
341153106543002			4242		Rio Grande		01S.01W.26.200B	34.198056	-106.9083	
341153106543003			4242		Rio Grande		01S.01W.26.200C	34.198056	-106.9083	
341157106542101	19850129	13.25	4242	4228.8	Rio Grande		01S.01W.26.223	34.198056	-106.9061	
341157106542101	19950209	12.8	4242	4229.2	Rio Grande		01S.01W.26.223	34.198056	-106.9061	
341152106542301			4242		Rio Grande		01S.01W.26.242	34.197778	-106.9064	600[c]
341121106543001			4242		Rio Grande		01S.01W.26.400	34.189167	-106.9083	
341124106541901	19520501	11	4242	4231.0	Rio Grande	85	01S.01W.26.442	34.19	-106.9053	
341150106552101			4242		Rio Grande		01S.01W.27.242	34.197222	-106.9225	
341117106560401	19770420	181	4242	4061.0	Rio Grande	240	01S.01W.27.343	34.188056	-106.9344	118[b]
341127106553501			4242		Rio Grande		01S.01W.27.400	34.190833	-106.9264	
341138106552801	19580501	42	4242	4200.0	Rio Grande	80	01S.01W.27.422	34.193889	-106.9244	
341130106553301	19760309	96	4242	4146.0	Rio Grande	125	01S.01W.27.423	34.191667	-106.9258	
341120106553701			4242		Rio Grande		01S.01W.27.434	34.188889	-106.9269	
341126106552201			4242		Rio Grande		01S.01W.27.442	34.190556	-106.9228	
341040106554001	19520501	94	4242	4148.0	Rio Grande	200	01S.01W.34.414	34.177778	-106.9278	
341047106552101			4242		Rio Grande		01S.01W.34.422	34.179722	-106.9225	
341104106550001	19520101	14	4242	4228.0	Rio Grande	70	01S.01W.35.123	34.184444	-106.9167	
341058106545501			4242		Rio Grande		01S.01W.35.142	34.182778	-106.9153	
341047106541101	19560517	3.33	4242	4238.7	Rio Grande	8	01S.01W.36.311	34.179722	-106.9031	
341319106410301	19850131	289.5	4242	3952.5	Rio Grande		01S.02E.13.412	34.221944	-106.6842	
341319106410301	19950207	282.19	4242	3959.8	Rio Grande		01S.02E.13.412	34.221944	-106.6842	
341319106410301	20000204	280.25	4242	3961.8	Rio Grande		01S.02E.13.412	34.221944	-106.6842	
341245106460001	19500126	102.79	4242	4139.2	Rio Grande		01S.02E.19.220	34.2125	-106.7667	

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[c]Clark Summers (1971)

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341246106460901	19850131	41.92	4242	4200.1	Rio Grande		01S.02E.19.241	34.212778	-106.7692	
341246106460901	19900124	37.64	4242	4204.4	Rio Grande		01S.02E.19.241	34.212778	-106.7692	
341246106460901	19950208	37.62	4242	4204.4	Rio Grande		01S.02E.19.241	34.212778	-106.7692	
341246106460901	20000204	35.4	4242	4206.6	Rio Grande		01S.02E.19.241	34.212778	-106.7692	
341240106450001	19500223	5.27	4242	4236.7	Rio Grande		01S.02E.20.240	34.211111	-106.75	
341210106424801			4242		Rio Grande		01S.02E.22.444 STAPLETON	34.202778	-106.7133	
341159106404301	19490812	9	4242	4233.0	Rio Grande		01S.02E.25.221	34.199722	-106.6786	
341120106453501	19500127	4.7	4242	4237.3	Rio Grande		01S.02E.29.340	34.188889	-106.7597	
341422107013001			4242		La Jencia		01S.02W.11.133A	34.239444	-107.025	
341203107052401	19600601	165	4242	4077.0	La Jencia	280	01S.02W.30.121	34.200833	-107.09	
341507106362401	19490812	69.87	4242	4172.1			01S.03E.02.311	34.251944	-106.6067	
341534106384201	19850131	50.84	4242	4191.2	Rio Grande	55	01S.03E.05.222	34.259444	-106.645	
341520106402201	19491228	11	4242	4231.0	Rio Grande	47	01S.03E.06.321	34.2525	-106.6731	2.5[b]
341520106402201	19850131	11.17	4242	4230.8	Rio Grande	47	01S.03E.06.321	34.2525	-106.6731	
341520106402201	19900124	13.2	4242	4228.8	Rio Grande	47	01S.03E.06.321	34.2525	-106.6731	
341520106402201	19950208	11.66	4242	4230.3	Rio Grande	47	01S.03E.06.321	34.2525	-106.6731	
341520106402201	20000204	11.99	4242	4230.0	Rio Grande	47	01S.03E.06.321	34.2525	-106.6731	
341437106345401	19490812	36.11	4242	4205.9			01S.03E.12.211	34.243611	-106.5817	
341324106373401	19490812	52.21	4242	4189.8			01S.03E.16.244	34.223333	-106.6261	
341107106371201	194908	357	4242	3885.0			01S.03E.34.121	34.185278	-106.62	
341107106371201	19490801	357	4242	3885.0			01S.03E.34.121	34.185278	-106.62	
341502107114801	19850131	11.17	4242	4230.8	La Jencia	47	01S.03W.06.321	34.250556	-107.1967	
341502107114801	19900124	13.2	4242	4228.8	La Jencia	47	01S.03W.06.321	34.250556	-107.1967	
341424107115901	19800701	238.93	4242	4003.1	La Jencia		01S.03W.07.131	34.24	-107.1997	
341426107064301	19600601	118	4242	4124.0	La Jencia	185	01S.03W.12.131	34.240556	-107.1119	
341400107064701	19620701	119	4242	4123.0	La Jencia		01S.03W.12.331	34.233333	-107.1131	
341332107070501			4242		La Jencia		01S.03W.14.241	34.225556	-107.1181	
341341107103501	19800715	182.5	4242	4059.5	La Jencia		01S.03W.17.124	34.228056	-107.1764	0.5[b]
341153107112301			4242		La Jencia		01S.03W.30.213	34.198056	-107.1897	
341027107112601	19620701	301	4242	3941.0	La Jencia	390	01S.03W.31.433	34.174167	-107.1906	
341445106333601	19490812	138.5	4242	4103.5			01S.04E.06.443	34.245833	-106.56	
341244106241701	19500921	28	4242	4214.0			01S.05E.22.223	34.212222	-106.4047	
341037106252501			4242				01S.05E.33.	34.176944	-106.4236	

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[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341313106141801	19500101	600	4242	3642.0			01S.07E.17.410	34.220278	-106.2383	
341153107363701	19771214	213.16	4242	4028.8			01S.07W.30.111	34.198056	-107.6103	
341448106031501			4242				01S.08E.01.433	34.246667	-106.0542	
341525106051001			4242				01S.08E.03.214	34.256944	-106.0861	
341502106064001			4242				01S.08E.04.323	34.250556	-106.1111	
341356106080801			4242			500	01S.08E.07.332	34.232222	-106.1522	
341413106064701			4242			610	01S.08E.09.310	34.236944	-106.1131	
341413106042201	19550101	650	4242	3592.0		842	01S.08E.11.322	34.236944	-106.1131	
341220106062501	19500801	650	4242	3592.0			01S.08E.21.431	34.205556	-106.1069	
341254106044701			4242			620	01S.08E.23.111	34.215	-106.0797	
341520107375601	19771215	205.68	4242	4036.3			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341520107375601	19780216	205.86	4242	4036.1			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341520107375601	19790214	205.98	4242	4036.0			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341520107375601	19800116	206.61	4241.4	4034.8			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341520107375601	19800923	209.02	4320	4111.0			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341520107375601	19810316	206.36	4242	4035.6			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341520107375601	19900130	207.24	4242	4034.8			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341520107375601	19910211	211.33	4242	4030.7			01S.08W.02.241 IRR NO 1	34.255556	-107.6322	
341458107381801	19771215	211.41	4242	4030.6			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19780216	210.58	4242	4031.4			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19781115	212.42	4242	4029.6			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19790214	211.65	4242	4030.4			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19800116	212.17	4242	4029.8			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19800429	211.63	4242	4030.4			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19800923	214.1	4242	4027.9			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19810316	212.03	4242	4030.0			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19900130	212.82	4242	4029.2			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19910211	215.59	4242	4026.4			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19920217	214.52	4242	4027.5			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19930222	215.12	4242	4026.9			01S.08W.02.442	34.249444	-107.6383	
341458107381801	19960208	216.71	4242	4025.3			01S.08W.02.442	34.249444	-107.6383	
341458107381801	20010206	212.36	4242	4029.6			01S.08W.02.442	34.249444	-107.6383	
341523107423801			4242				01S.08W.06.123	34.256389	-107.7106	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
341353107392301	19771215	217.62	4242	4024.4			01S.08W.10.341	34.231389	-107.6564	
341243107404801	19771215	283.6	4242	3958.4			01S.08W.21.111	34.211944	-107.68	
341243107404801	19910211	252.45	4242	3989.6			01S.08W.21.111	34.211944	-107.68	
341243107404801	19960208	249.3	4242	3992.7			01S.08W.21.111	34.211944	-107.68	
341243107404801	20010206	251.03	4242	3991.0			01S.08W.21.111	34.211944	-107.68	
341016107375601	19771214	185.02	4242	4057.0			01S.08W.35.441	34.171111	-107.6322	
341016107375601	19910211	185.9	4242	4056.1			01S.08W.35.441	34.171111	-107.6322	
341016107375601	19960208	189.91	4242	4052.1			01S.08W.35.441	34.171111	-107.6322	
341501106002901	19500801	600	4242	3642.0			01S.09E.04.314	34.250278	-106.0081	
341518106012001	19500801	650	4242	3592.0			01S.09E.05.141	34.255	-106.0222	
341423106023001	19500801	618	4242	3624.0			01S.09E.07.134	34.239722	-106.0417	
341423106023001	19570312		4242				01S.09E.07.134	34.239722	-106.0417	
341431106002201	19500801	657	4242	3585.0			01S.09E.09.141	34.241944	-106.0061	
342831106461401			4242		Rio Grande	65	2030219200	34.475278	-106.7706	
342537106490801	19830330	2.05	4242	4240.0	Rio Grande		02N.01E.03.421	34.426944	-106.8189	
342513106500301	19771111	12	4242	4230.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19830127	13.5	4242	4228.5	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19830224	12.46	4242	4229.5	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19830330	12.16	4242	4229.8	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19830426	12.11	4242	4229.9	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19830531	11.84	4242	4230.2	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19830630	12.02	4242	4230.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19830729	12.32	4242	4229.7	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19831007	11.97	4242	4230.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19831201	12.42	4242	4229.6	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19840224	12.49	4242	4229.5	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19840313	13.22	4242	4228.8	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19840730	12.69	4242	4229.3	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19840828	12.07	4242	4229.9	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19850423	11.38	4242	4230.6	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19850905	12.19	4242	4229.8	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19860129	13.61	4242	4228.4	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19860402	12.48	4242	4229.5	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342513106500301	19860530	11.85	4242	4230.2	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19860801	14.8	4242	4227.2	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19870121	11.76	4242	4230.2	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19870630	12.23	4242	4229.8	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19880726	12.07	4242	4229.9	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19890130	11.99	4242	4230.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19890707	12.66	4242	4229.3	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19900209	11.99	4242	4230.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19900706	12.74	4242	4229.3	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19910103	12.82	4242	4229.2	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19910702	12.51	4242	4229.5	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19911001	11.88	4242	4230.1	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19920109	11.88	4242	4230.1	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19920714	11.7	4242	4230.3	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19930112	12	4242	4230.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19930630	12.04	4242	4230.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19931230	12.28	4242	4229.7	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19940630	12.74	4242	4229.3	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19950123	12.22	4242	4229.8	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19950629	12.21	4250	4237.8	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19951031	12.07	4263	4250.9	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19960229	12.52	4300	4287.5	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19960924	12.13	4250	4237.9	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19970429	11.45	4250	4238.6	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19980212	11.54	4250	4238.5	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19980729	12.09	4250	4237.9	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	19990720	12.22	4295	4282.8	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	20000210	13	4650	4637.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342513106500301	20000823	12.01	4695	4683.0	Rio Grande	107	02N.01E.04.444	34.420278	-106.8342	
342512106500701			4880		Rio Grande		02N.01E.09.220	34.42	-106.8353	
342349106501701	19490810	15	4875	4860.0	Rio Grande		02N.01E.16.430	34.396944	-106.8381	
342300106492601	19560517	3.86	5021	5017.1	Rio Grande	110	02N.01E.22.233	34.383333	-106.8239	1800[b]
342300106492601	19570131	5.5	5021	5015.5	Rio Grande	110	02N.01E.22.233	34.383333	-106.8239	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342300106492601	19580116	2.22	4984	4981.8	Rio Grande	110	02N.01E.22.233	34.383333	-106.8239	
342255106484401			5585		Rio Grande		02N.01E.23.323	34.381944	-106.8122	
342215106500101	19560517	16.73	4250	4233.3	Rio Grande		02N.01E.27.131	34.370833	-106.8336	1450[b]
342107106530401	19750708	137	4300	4163.0	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19821216	137.2	4250	4112.8	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19830127	136.79	4242	4105.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19830224	136.75	4242	4105.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19830330	137.04	4242	4105.0	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19830426	136.72	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19830531	136.64	4250	4113.4	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19830711	137.01	4250	4113.0	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19830801	137.08	4250	4112.9	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19831007	137.1	4250	4112.9	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19831202	136.86	4250	4113.1	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19840131	136.55	4250	4113.5	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	198403	136.69	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19840430	137.05	4250	4113.0	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19840610	136.94	4250	4113.1	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19840730	139.24	4250	4110.8	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19850228	136.88	4250	4113.1	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19850423	136.52	4250	4113.5	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19850905	136.97	4250	4113.0	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19860129	136.73	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19860530	136.9	4250	4113.1	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19860801	136.21	4250	4113.8	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19870121	136.85	4250	4113.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19870630	136.75	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19870730	138.84	4250	4111.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19871230	136.75	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19880726	139.78	4250	4110.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19890130	137.08	4250	4112.9	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19890707	137.32	4250	4112.7	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19900209	137.17	4250	4112.8	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342107106530401	19900706	137.19	4250	4112.8	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19910103	137.2	4250	4112.8	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19910702	139.36	4250	4110.6	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19911002	136.72	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19920109	136.92	4250	4113.1	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19920714	136.79	4250	4113.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19930112	136.7	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19930630	136.6	4250	4113.4	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19931230	136.9	4250	4113.1	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19940630	136.71	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19950120	136.71	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19950629	136.83	4250	4113.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19951031	136.64	4250	4113.4	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19960125	136.48	4250	4113.5	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19960924	137.16	4250	4112.8	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19970429	136.83	4250	4113.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19980212	136.69	4250	4113.3	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19980729	137.34	4250	4112.7	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	19990720	137.47	4250	4112.5	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	20000210	137.52	4250	4112.5	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	20000823	137.01	4250	4113.0	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342107106530401	20001211	136.8	4250	4113.2	Rio Grande	223	02N.01E.31.313	34.351944	-106.8844	
342426106555901			4250		Rio Grande	316	02N.01W.10.341	34.407222	-106.9331	
342413106532201	19490715	133.89	4250	4116.1	Rio Grande		02N.01W.13.223	34.403611	-106.8894	
342413106314701	19491130	7.02	4250	4243.0	Rio Grande	56.5	02N.01W.30.341	34.365	-106.9861	
342602106464201	19570501	50	4250	4200.0	Rio Grande	100	02N.02E.06.112	34.433889	-106.7783	500[b]
342426106444301	19491207	254	4250	3996.0	Rio Grande		02N.02E.09.330	34.407222	-106.7453	3[b]
342428106444501			4250		Rio Grande		02N.02E.17.	34.407778	-106.7458	
342147106472601			4250		Rio Grande		02N.02E.30.334	34.363056	-106.7906	
342056106465201	19630301	21	4250	4229.0	Rio Grande	173	02N.02E.31.333	34.348889	-106.7811	
342509107002201			4250		Rio Grande	280	02N.02W.12.112	34.419167	-107.0061	
342335107003001	19490721	84.5	4250	4165.5	Rio Grande		02N.02W.14.440	34.393056	-107.0083	
342156106594201			4250		Rio Grande		02N.02W.36.440	34.365556	-106.995	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342515106451001	19821002	258.54	4250	3991.5	Rio Grande		02N.03E.05.434	34.420833	-106.7528	
342515106451001	19821216	242.29	4250	4007.7	Rio Grande		02N.03E.05.434	34.420833	-106.7528	
342515106451001	19830127	242.1	4250	4007.9	Rio Grande		02N.03E.05.434	34.420833	-106.7528	
342703106371401	19490902	378	4250	3872.0	Rio Grande		02N.03E.10.410	34.450833	-106.6206	
342703106371401	19810130	371.25	4250	3878.8	Rio Grande		02N.03E.10.410	34.450833	-106.6206	
342406106394501	19491207	327.43	4250	3922.6	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19830330	310.26	4250	3939.7	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19830426	309.86	4250	3940.1	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19830531	309.82	4250	3940.2	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19830630	310.01	4250	3940.0	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19830729	329.61	4250	3920.4	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19831007	310.03	4250	3940.0	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19831027	317.55	4250	3932.5	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19831201	317.42	4250	3932.6	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19840131	311.6	4250	3938.4	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19840224	309.99	4250	3940.0	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19840313	309.98	4250	3940.0	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19840730	309.88	4250	3940.1	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19840828	309.93	4250	3940.1	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19850228	309.8	4250	3940.2	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19850423	327.25	4250	3922.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19850905	318.43	4250	3931.6	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19860129	311.38	4250	3938.6	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19860402	314.15	4250	3935.9	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19860609	310.68	4250	3939.3	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19860801	317.42	4250	3932.6	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19870630	309.25	4250	3940.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19870730	309.56	4250	3940.4	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19871230	309.16	4250	3940.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19880726	309.2	4250	3940.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19890130	309.18	4250	3940.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19890707	309.18	4250	3940.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19900209	308.82	4250	3941.2	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342406106394501	19900706	308.87	4250	3941.1	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19910103	308.89	4250	3941.1	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19910702	308.68	4250	3941.3	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19911002	308.52	4250	3941.5	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19920109	308.71	4250	3941.3	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19920714	308.68	4250	3941.3	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19930112	308.53	4250	3941.5	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19930630	308.46	4250	3941.5	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19940209	308.22	4250	3941.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19940630	308.4	4250	3941.6	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19950120	308.33	4250	3941.7	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19950629	308.45	4250	3941.6	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19951031	308.16	4250	3941.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19960125	308.08	4250	3941.9	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19960924	308.19	4250	3941.8	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19970429	308.03	4250	3942.0	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19980212	307.99	4250	3942.0	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19980729	310.79	4250	3939.2	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	19990720	310.88	4250	3939.1	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	20000210	308.02	4250	3942.0	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	20000823	307.88	4250	3942.1	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342406106394501	20001211	307.63	4250	3942.4	Rio Grande	346	02N.03E.18.232	34.401944	-106.6644	
342244106382501	19600715	55	4250	4195.0	Rio Grande	114	02N.03E.21.330	34.378889	-106.6403	
342523106305701	19490902	21	4250	4229.0	Rio Grande	25	02N.04E.03.310	34.423056	-106.5158	
342458106283301			4250		Rio Grande		02N.04E.12.210 DRIPPING	34.416111	-106.4758	
342458106281601	19490804	28.15	4250	4221.9	Rio Grande		02N.04E.12.223	34.416111	-106.4711	
342412106291801			4250		Rio Grande		02N.04E.14.200	34.403333	-106.4883	
342413106311701			4250		Rio Grande		02N.04E.16.24	34.403611	-106.5214	
342307106333401	19490726	15.25	4250	4234.8	Rio Grande		02N.04E.19.200	34.385278	-106.5594	
342314106291801	19490804	9.3	4250	4240.7	Rio Grande		02N.04E.23.223	34.387222	-106.4883	
342146106314501	19490728	32.7	4250	4217.3	Rio Grande		02N.04E.28.321	34.362778	-106.5292	
342127106283801	19490822	19.75	4250	4230.3			02N.04E.36.124	34.3575	-106.4772	
342450107155601			4250				02N.04W.09.141 RILEY SP	34.413889	-107.2656	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342346107133801	19780816	41.5	4250	4208.5		242	02N.04W.14.324	34.396111	-107.2272	3[b]
342552106251301	19500811	29.68	4250	4220.3	Rio Grande		02N.05E.04.223	34.431111	-106.4203	
342510106253201	19800430	38	4250	4212.0	Rio Grande	153	02N.05E.04.300	34.419444	-106.4256	1[b]
342530106271001			4250		Rio Grande		02N.05E.06.224	34.425	-106.4528	
342419106260301	19490804	123.15	4250	4126.9	Rio Grande		02N.05E.08.430	34.405278	-106.4342	
342307106260301	19490728	38.35	4250	4211.7			02N.05E.20.244	34.385278	-106.4342	2[b]
342156106260101			4250				02N.05E.29.240	34.373056	-106.4175	
342133106250501	19491116	41.1	4250	4208.9			02N.05E.33.222	34.359167	-106.4181	
342423107202701			4250				02N.05W.10.444	34.406389	-107.3408	
342236107225001			4250				02N.05W.20.434	34.376667	-107.3806	
342236107224301			4250				02N.05W.20.443	34.376667	-107.3786	
342258107220701			4250				02N.05W.21.322	34.382778	-107.3686	
342249107221001			4250				02N.05W.21.324	34.380278	-107.3694	
342234107221901			4250				02N.05W.29.221	34.376111	-107.3719	
342154107243801	19850918	8.69	4250	4241.3			02N.05W.30.331	34.365	-107.4106	
342140107233701	19750813	15.2	4250	4234.8		50	02N.05W.31.222	34.361111	-107.3936	
342140107233701	19850918	19.24	4250	4230.8		50	02N.05W.31.222	34.361111	-107.3936	
342538107254401	19831102	5.37	4250	4244.6		15	02N.06W.02.4222	34.427222	-107.4289	
342530107254501			4250			15	02N.06W.02.424	34.425	-107.4292	
342534107270601	19750811	18.05	4250	4232.0			02N.06W.03.412	34.426111	-107.4517	
342534107270601	19850917	20.24	4250	4229.8			02N.06W.03.412	34.426111	-107.4517	
342518107275601	19750801	2	4250	4248.0		10	02N.06W.04.443	34.421667	-107.4656	
342518107275601	19850917	6.69	4250	4243.3		10	02N.06W.04.443	34.421667	-107.4656	
342518107275301	19750814	16.75	4250	4233.3			02N.06W.04.444	34.421667	-107.4647	
342552107303601	19400901	66.8	4250	4183.2			02N.06W.06.123	34.431111	-107.51	10[b]
342552107303601	19850917	62.09	4250	4187.9			02N.06W.06.123	34.431111	-107.51	
342554107303201	19750812	100.68	4250	4149.3			02N.06W.06.1234	34.431667	-107.5089	
342554107303201	19850917	96.16	4250	4153.8			02N.06W.06.1234	34.431667	-107.5089	
342508107304101			4250				02N.06W.07.112	34.418889	-107.5114	
342456107302101	19850907	74.05	4250	4176.0		180	02N.06W.07.231	34.415556	-107.5058	
342440107302001	19750812	24.2	4250	4225.8			02N.06W.07.411	34.411111	-107.5056	25[b]
342440107302001	19850917	82.3	4250	4167.7			02N.06W.07.411	34.411111	-107.5056	
342455107294901	19750812	18.79	4250	4231.2			02N.06W.08.131	34.415278	-107.4969	15[b]

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342455107294901	19850917	21.19	4250	4228.8			02N.06W.08.131	34.415278	-107.4969	
342423107282001			4250				02N.06W.09.344	34.406389	-107.4722	
342438107280101			4250				02N.06W.09.423	34.410556	-107.4669	
342300107272201			4250				02N.06W.15.142	34.383333	-107.4561	
342338107272601			4250				02N.06W.15.341	34.393889	-107.4572	
342418107293701	19810818	212	4250	4038.0			02N.06W.17.112	34.405	-107.4936	
342343107285501			4250				02N.06W.17.424	34.395278	-107.4819	
342336107285801			4250				02N.06W.17.442	34.393333	-107.4828	
342532107254101			4250			15	02N.06W.2 ALAMO WELL NO.	34.425556	-107.4281	
342539107254101			4250			15	02N.06W.2 ALAMO WELL NO.	34.4275	-107.4281	
342322107293801	19850917	18.62	4250	4231.4			02N.06W.20.114	34.389444	-107.4939	
342249107285801	19850918	130.14	4250	4119.9		195	02N.06W.21.431	34.380278	-107.4828	
342247107281601	19850918	135.41	4250	4114.6			02N.06W.21.431A	34.379722	-107.4711	
342146107251401			4250				02N.06W.25.344	34.362778	-107.4206	
342158107244001	19850918	19.17	4250	4230.8		140	02N.06W.25.424	34.366111	-107.4111	
342149107244501	19810924	28	4250	4222.0			02N.06W.25.442	34.363611	-107.4125	
342214107261501	19850918	7.26	4250	4242.7			02N.06W.26.144	34.370556	-107.4375	
342205107255401			4250				02N.06W.26.241+DUP	34.368056	-107.4317	
342218107255001			4250				02N.06W.26.241A	34.371667	-107.4306	
342208107260001			4250				02N.06W.26.412	34.368889	-107.4333	
342154107260001			4250				02N.06W.26.432	34.365	-107.4333	
342231107264801	19750813	145.79	4250	4104.2			02N.06W.27.222	34.375278	-107.4467	
342231107264801	19850918	119.57	4250	4130.4			02N.06W.27.222	34.375278	-107.4467	
342121107293901	19750812	59	4250	4191.0			02N.06W.32.134	34.355833	-107.4942	15[b]
342121107293901	19850918	72.67	4250	4177.3			02N.06W.32.134	34.355833	-107.4942	
342058107294701	19850918	123.59	4250	4126.4			02N.06W.32.331	34.349444	-107.4964	
342104107262001			4250				02N.06W.35.324	34.351111	-107.4389	
342105107235001	19850918	5.99	4250	4244.0			02N.06W.35.414	34.351389	-107.3972	
342128107250501			4250				02N.06W.36.231	34.357778	-107.4181	
342601107315101	19821123	43.4	4250	4206.6			02N.07W.01.111	34.433611	-107.5308	
342601107315102			4250				02N.07W.01.111A	34.433611	-107.5308	
342502106314001	19850917	92.1	4250	4157.9		250	02N.07W.12.114	34.417222	-107.5289	
342442107305801	19821123	48.05	4250	4202.0			02N.07W.12.422	34.411667	-107.5161	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
342416107310201	19821123	42.2	4250	4207.8			02N.07W.13.222	34.404444	-107.5172	
342353107310801	19850917	5.79	4250	4244.2			02N.07W.13.243	34.398056	-107.5189	
342342107312801	19850916	50	4250	4200.0			02N.07W.13.324	34.395	-107.5244	
342344107320601			4250				02N.07W.14.423	34.395556	-107.535	
342342107363201	19810602	83.46	4250	4166.5		110	02N.07W.18.414	34.395	-107.6089	
342257107353001	19810602	228.07	4250	4021.9		400	02N.07W.20.411	34.3825	-107.5917	
342236107333401	19750815	33.98	4250	4216.0			02N.07W.22.334	34.376667	-107.5594	
342318107311801			4250				02N.07W.24.214	34.388333	-107.5217	
342230107334601			4250				02N.07W.27.121	34.375	-107.5628	
342113107351001	19810602	24.87	4250	4225.1		35	02N.07W.32.422	34.353611	-107.5861	
342128107332201			4250				02N.07W.34.212+DUP	34.357778	-107.5561	
342137107332001	19810602	57.64	4250	4192.4		90	02N.07W.34.212A	34.360278	-107.5556	
342428107392701	19810602	39.95	4250	4210.1		46	02N.08W.10.441	34.407778	-107.6575	2[b]
342230107394601	19800418	32	4250	4218.0		74	02N.08W.27.211	34.375	-107.6628	30[b]
340940106515501	19520501	4	4250	4246.0	Rio Grande		02S.01E.05.341	34.161111	-106.8653	
340910106524201			4250		Rio Grande		02S.01E.07.200	34.152778	-106.8783	
340842106523601	19591119	58	4250	4192.0	Rio Grande	108	02S.01E.07.430	34.145	-106.8767	
340832106480901			4250		Rio Grande		02S.01E.12.341 UNNAMED S	34.142222	-106.8025	
340847106473801			4250		Rio Grande		02S.01E.14.221 OJO PARID	34.1425	-106.8025	
340738106525101	19671005	9.5	4250	4240.5	Rio Grande	107	02S.01E.19.120	34.127222	-106.8808	
340724106524001	19660301	40	4250	4210.0	Rio Grande		02S.01E.19.233	34.123333	-106.8778	
340706106525701			4250		Rio Grande		02S.01E.19.300	34.118333	-106.8825	
340713106525801	19520501	3	4250	4247.0	Rio Grande	13	02S.01E.19.321	34.120278	-106.8828	
340706106490301			4250		Rio Grande		02S.01E.23.331	34.118333	-106.8175	
340644106184301			4250				02S.01E.26.121	34.112222	-106.3119	
340646106485101			4250		Rio Grande		02S.01E.26.123 UNNAMED S	34.112778	-106.8142	
340629106491701			4250		Rio Grande		02S.01E.27.243	34.108056	-106.8214	
340629106491001			4250		Rio Grande		02S.01E.27.243 OJO AMADO	34.108056	-106.8194	
340604106520301	19670923	45	4250	4205.0	Rio Grande	96	02S.01E.29.330	34.101111	-106.8675	
340639106530201	19510101	10	4250	4240.0	Rio Grande	95	02S.01E.30.132	34.110833	-106.8839	2700[b]
340639106522601	19520501	5	4250	4245.0	Rio Grande	13	02S.01E.30.241	34.110833	-106.8739	
340512106524601	19520501	8	4250	4242.0	Rio Grande	63	02S.01E.31.344	34.086667	-106.8794	
340520106520201	19660301	26	4250	4224.0	Rio Grande		02S.01E.32.332	34.088889	-106.8672	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
340933106541601			4250		Rio Grande		02S.01W.01.333	34.159167	-106.9044	
340940106535001			4250		Rio Grande		02S.01W.01.342	34.161111	-106.8972	
341010106550501	19771003	40	4250	4210.0	Rio Grande	80	02S.01W.02.100	34.169444	-106.9181	30[b]
341012106545401	19850204	16.43	4250	4233.6	Rio Grande		02S.01W.02.124	34.17	-106.915	
341012106545401	19900131	16.41	4250	4233.6	Rio Grande		02S.01W.02.124	34.17	-106.915	
341012106545401	19950213	16.23	4250	4233.8	Rio Grande		02S.01W.02.124	34.17	-106.915	
340944106550501	19780805	80	4250	4170.0	Rio Grande	141	02S.01W.02.300	34.162222	-106.9181	50[b]
340943106550301			4250		Rio Grande		02S.01W.02.300+DUP	34.161944	-106.9175	
340935106545501			4250		Rio Grande		02S.01W.02.344A	34.159722	-106.9153	
340943106543101			4250		Rio Grande		02S.01W.02.400	34.161944	-106.9086	
340948106544701			4250		Rio Grande		02S.01W.02.413	34.163333	-106.9131	
340935106544001			4250		Rio Grande		02S.01W.02.434	34.159722	-106.9111	
340936106542201			4250		Rio Grande		02S.01W.02.444	34.16	-106.9061	
340924106554901	19781128	167	4250	4083.0	Rio Grande	202	02S.01W.10.211	34.156667	-106.9303	30[b]
340927106553501			4250		Rio Grande		02S.01W.10.221 LEWARK WE	34.1575	-106.9264	
340926106551801	19720428	140	4250	4110.0	Rio Grande	180	02S.01W.11.111	34.157222	-106.9217	
340920106550901			4250		Rio Grande		02S.01W.11.114	34.155556	-106.9192	
340920106545501			4250		Rio Grande		02S.01W.11.124	34.155556	-106.9153	
340911106543101			4250		Rio Grande		02S.01W.11.200	34.153056	-106.9086	
340920106544701			4250		Rio Grande		02S.01W.11.213	34.155556	-106.9131	
340924106542201			4250		Rio Grande		02S.01W.11.222	34.156667	-106.9061	5[c]
340915106542901			4250		Rio Grande		02S.01W.11.241	34.154167	-106.9081	
340914106542001	19540101	25	4250	4225.0	Rio Grande	70	02S.01W.11.242	34.153889	-106.9056	4[c]
340906106540601			4250		Rio Grande		02S.01W.11.243 SIDWELL W	34.151667	-106.9017	
340907106542001			4250		Rio Grande		02S.01W.11.244	34.151944	-106.9056	
340844106551301	19721025	143	4250	4107.0	Rio Grande	181	02S.01W.11.330	34.145556	-106.9203	25[b]
340852106543301			4250		Rio Grande		02S.01W.11.400	34.147778	-106.9092	
340858106542501	19800707	223	4250	4027.0	Rio Grande	250	02S.01W.11.420	34.149444	-106.9069	
340855106540701			4250		Rio Grande		02S.01W.12.314	34.148611	-106.9019	
340859106534901	19510101	23	4250	4227.0	Rio Grande		02S.01W.12.322	34.149722	-106.8969	
340827106540001	19520501	26	4250	4224.0	Rio Grande	104	02S.01W.13.113	34.140833	-106.9	
340814106540801			4250		Rio Grande		02S.01W.13.134	34.137222	-106.9022	
340810106541601			4250		Rio Grande		02S.01W.13.311	34.136111	-106.9044	900[c]

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
340825106543201	19620326	42	4250	4208.0	Rio Grande	250	02S.01W.14.200	34.140278	-106.9089	10[b]
340716106592401			4250		Rio Grande		02S.01W.19.312	34.121111	-106.99	
340710106585301			4250		Rio Grande		02S.01W.19.414	34.119444	-106.9814	
340730106560301			4250		Rio Grande		02S.01W.22.141	34.125	-106.9342	
340737106541201	19790315	30	4250	4220.0	Rio Grande	105	02S.01W.24.110	34.126944	-106.9033	50[b]
340743106540001			4250		Rio Grande		02S.01W.24.121	34.128611	-106.9	
340710106532501			4250		Rio Grande		02S.01W.24.423	34.119444	-106.8903	
340705106534001			4250		Rio Grande		02S.01W.24.431	34.118056	-106.8944	
340650106535001			4250		Rio Grande		02S.01W.25.122	34.113889	-106.8972	
340640106533001			4250		Rio Grande		02S.01W.25.200	34.111111	-106.8917	
340613106540001			4250		Rio Grande		02S.01W.25.300A	34.103611	-106.9	
340613106540002			4250		Rio Grande		02S.01W.25.300B	34.103611	-106.9	
340620106535901			4250		Rio Grande		02S.01W.25.323	34.105556	-106.8997	
340619106535001	19630201	25	4250	4225.0	Rio Grande	47	02S.01W.25.324	34.105278	-106.8972	
340611106535801			4250		Rio Grande		02S.01W.25.341	34.103056	-106.8994	
340611106535101			4250		Rio Grande		02S.01W.25.342	34.103056	-106.8975	
340604106535101			4250		Rio Grande		02S.01W.25.344	34.101111	-106.8975	
340600106561501			4250		Rio Grande		02S.01W.25.344 LITTLE SH	34.1	-106.9375	
340619106551301	19620830	20	4250	4230.0	Rio Grande	150	02S.01W.26.310	34.105278	-106.9203	
340607106551201	19600604	144	4250	4106.0	Rio Grande	200	02S.01W.26.330	34.101944	-106.92	
340602106584401			4250		Rio Grande		02S.01W.30.443	34.100556	-106.9789	
340523106592401			4250		Rio Grande		02S.01W.31.314	34.089722	-106.99	
340547106543201			4250		Rio Grande		02S.01W.35.200	34.096389	-106.9089	
340422106543002			4250		Rio Grande		02S.01W.35.400	34.0875	-106.9083	
340600106541401			4250		Rio Grande		02S.01W.36.111	34.1	-106.9039	
340538106540501			4250		Rio Grande		02S.01W.36.134	34.093889	-106.9014	
340545106535001			4250		Rio Grande		02S.01W.36.142	34.095833	-106.8972	
340534106535401			4250		Rio Grande		02S.01W.36.1434 LUCAS GA	34.092778	-106.8983	
340553106533501			4250		Rio Grande	62	02S.01W.36.214	34.098056	-106.8931	
340533106540801			4250		Rio Grande		02S.01W.36.312	34.0925	-106.9022	
340527106540401			4250		Rio Grande	90	02S.01W.36.314	34.090833	-106.9011	
340525106535901			4250		Rio Grande		02S.01W.36.323 SAAVEDRA	34.090278	-106.8997	
340511106534301	19850206	15.49	4250	4234.5	Rio Grande		02S.01W.36.433	34.086389	-106.8953	

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340511106534301	19860113	15.14	4250	4234.9	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19870319	15.2	4250	4234.8	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19880115	15.05	4250	4235.0	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19890307	15.22	4250	4234.8	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19890915	14.99	4250	4235.0	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19900126	15.12	4250	4234.9	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19910207	15.11	4250	4234.9	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19910717	14.58	4250	4235.4	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19920203	14.68	4250	4235.3	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19930202	14.97	4250	4235.0	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19950206	14.8	4250	4235.2	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
340511106534301	19970128	15.32	4250	4234.7	Rio Grande		02S.01W.36.433	34.086389	-106.8953	
341024106440601			4250		Rio Grande	10	02S.02E.03.111 BACA WELL	34.173333	-106.735	
341014106450810			4250		Rio Grande		02S.02E.05.223	34.170556	-106.7522	
340932106464801			4250		Rio Grande	160	02S.02E.06.334 PARIDA WE	34.158889	-106.78	
340925106465001	19500127	11.8	4250	4238.2	Rio Grande		02S.02E.07.112	34.156944	-106.7806	
340904106424401			4250		Rio Grande		02S.02E.11.311 GALLINA W	34.151111	-106.7122	
340727106415401			4250		Rio Grande		02S.02E.23.241 BUSTOS WE	34.124167	-106.6983	
340630106460701			4250		Rio Grande		02S.02E.30.234 OJO DEL R	34.108333	-106.7686	
340535106434201	19850204	33.35	4250	4216.7	Rio Grande	102	02S.02E.34.134	34.093056	-106.7283	
340535106434201	19900130	45.3	4250	4204.7	Rio Grande	102	02S.02E.34.134	34.093056	-106.7283	
340535106434201	19900131	45.3	4250	4204.7	Rio Grande	102	02S.02E.34.134	34.093056	-106.7283	
340535106434201	19950206	36.17	4250	4213.8	Rio Grande	102	02S.02E.34.134	34.093056	-106.7283	
340853107052301	19600601	150	4250	4100.0	La Jencia	150	02S.02W.07.324	34.148056	-107.0897	
340835107053501	19600601	144	4250	4106.0	La Jencia	150	02S.02W.18.112	34.143056	-107.0931	
340808107053101	19670801	118	4250	4132.0	La Jencia		02S.02W.18.321	34.135556	-107.0919	
340720107044901	19620701	121	4250	4129.0	La Jencia	160	02S.02W.19.422	34.122222	-107.0803	
340720107044901	196708	122	4250	4128.0	La Jencia	160	02S.02W.19.422	34.122222	-107.0803	
340230107044501			4250		La Jencia		02S.02W.20.116	34.041667	-107.0792	
340714107044601	19620701	131	4250	4119.0	La Jencia	160	02S.02W.20.311	34.120556	-107.0794	
340656107034101	19620701	156	4250	4094.0	La Jencia	181	02S.02W.21.333	34.115556	-107.0614	
340520107020001	19600601	100	4250	4150.0	La Jencia	134	02S.02W.34.432	34.088889	-107.0333	
340532107012101	19620701	24	4250	4226.0	La Jencia		02S.02W.35.321	34.092222	-107.0225	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
340524107011801	19600601	22	4250	4228.0	La Jencia		02S.02W.35.323	34.09	-107.0217	
340526107011001			4250		La Jencia		02S.02W.35.324	34.090556	-107.0194	
340525107011301			4250		La Jencia		02S.02W.35.324 SNAKE RAN	34.090278	-107.0203	
340510107013001			4250		La Jencia		02S.02W.35.333	34.086111	-107.025	
340525107011501			4250		La Jencia		02S.02W.35.342	34.090278	-107.0208	
340627106370601			4250			325	02S.03E.27.114 WILD HORS	34.1075	-106.6183	
340623106370201	19820530	289	4250	3961.0		326	02S.03E.27.411	34.106389	-106.6172	20[b]
340515106352801			4250				02S.03E.36.331 NEW WELL	34.0875	-106.5911	
340949107063901	19670801	175	4250	4075.0	La Jencia		02S.03W.01.312	34.163611	-107.1108	
340950107062001			4250		La Jencia		02S.03W.01.322	34.163889	-107.1056	
340839107113701	19620701	204	4250	4046.0			02S.03W.07.344	34.144167	-107.1936	
340840107112501			4250				02S.03W.07.433	34.144444	-107.1903	
340840107074801	19670801	244	4250	4006.0	La Jencia		02S.03W.11.333	34.144444	-107.13	
340820107103601	19670801	473	4250	3777.0	La Jencia		02S.03W.17.142	34.138889	-107.1767	
340741107085101	19620701	312	4250	3938.0	La Jencia		02S.03W.22.111	34.128056	-107.1475	
340738107081301			4250		La Jencia		02S.03W.22.114	34.127222	-107.1369	
340721107070401	19620701	205	4250	4045.0	La Jencia		02S.03W.23.243	34.1225	-107.1178	
340715107061501	19600601	158	4250	4092.0	La Jencia	160	02S.03W.24.411	34.120833	-107.1042	
340630107064701	19560123	230	4250	4020.0	La Jencia	280	02S.03W.25.133	34.108333	-107.1131	
340643107080601	19600601	347	4250	3903.0	La Jencia	420	02S.03W.27.223	34.111944	-107.135	
340635107081401	19620701	348	4250	3902.0	La Jencia		02S.03W.27.232	34.109722	-107.1372	
340518107114801			4250				02S.03W.31.332	34.088333	-107.1967	
340845107124501			4250				02S.04W.12.341	34.145833	-107.2125	
340750107123001			4250				02S.04W.13.433	34.130556	-107.2083	
340748107122001	19600601	155	4250	4095.0			02S.04W.13.434	34.13	-107.2056	
340823107145201			4250				02S.04W.15.100	34.139722	-107.2478	
340738107155201			4250				02S.04W.21.111 P. SPRING	34.127222	-107.2644	
340707107142001	19630501	180	4250	4070.0		190	02S.04W.22.434	34.118611	-107.2389	25[b,c]
340715107135001	19600601	138	4250	4112.0		150	02S.04W.23.321	34.120833	-107.2306	
340740107122901	19670801	188	4250	4062.0			02S.04W.24.211	34.127778	-107.2081	
340659107125901	19670701	66	4250	4184.0		730	02S.04W.24.333	34.116389	-107.2164	
340631107132501	19670701	131	4250	4119.0		140	02S.04W.26.230	34.108611	-107.2236	
340615107140101	19620810	78.55	4250	4171.5		136	02S.04W.26.313	34.104167	-107.2336	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
340602107140001	19600601	59	4250	4191.0		125	02S.04W.26.333	34.100556	-107.2333	
340611107135801			4250			240	02S.04W.26.342 PRICKETT	34.103056	-107.2328	
340603107140101			4250			180	02S.04W.26.344 BLOMQUIST	34.100833	-107.2336	
340614107130801	19670701	85	4250	4165.0		166	02S.04W.26.424	34.103889	-107.2189	
340646107150501	19600601	118	4250	4132.0		140	02S.04W.27.111	34.112778	-107.2514	
340646107141801	19600601	184	4250	4066.0		190	02S.04W.27.221	34.112778	-107.2383	
340555107135501	19510101	60	4250	4190.0		134	02S.04W.35.110	34.098611	-107.2319	10[c]
340555106261301	19850207	246.43	4250	4003.6			02S.05E.32.222	34.098611	-106.4369	
340555106261301	19900131	245.22	4250	4004.8			02S.05E.32.222	34.098611	-106.4369	
340555106261301	19950207	262.49	4250	3987.5			02S.05E.32.222	34.098611	-106.4369	
340652107222401	19790425	132.04	4250	4118.0			02S.05W.20.444	34.114444	-107.3733	
340635107200201			4250				02S.05W.26.100	34.109722	-107.3339	
340543107232401	19790425	376.91	4250	3873.1			02S.05W.32.113	34.095278	-107.39	
340900107285201	19790425	174.47	4250	4075.5			02S.06W.08.232	34.15	-107.4811	
340841107273101	19790425	176.25	4250	4073.8			02S.06W.09.424	34.144722	-107.4586	
340654107284201	19771214	109.5	4250	4140.5			02S.06W.20.441	34.115	-107.4783	
340654107284202	19790420	121.8	4250	4128.2			02S.06W.20.441A	34.115	-107.4783	
340711107253001	19790425	440	4250	3810.0			02S.06W.23.243	34.119722	-107.425	
340741106143801	19840707	438	4250	3812.0		620	02S.07E.20.111	34.128056	-106.2439	3-4[b]
340605106104201	19560126	748.6	4250	3501.4			02S.07E.25.300	34.101389	-106.1783	
340833107315601	19790420	340	4250	3910.0			02S.07W.11.431	34.1425	-107.5322	
340827107303001	19790420	373.8	4250	3876.2			02S.07W.12.444	34.140833	-107.5083	
340827107303001	19910212	373.73	4250	3876.3			02S.07W.12.444	34.140833	-107.5083	
340805107353701	19771214	180.25	4250	4069.8			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19910212	181.34	4250	4068.7			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19920217	180.19	4250	4069.8			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19930222	181.94	4250	4068.1			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19940228	180.8	4250	4069.2			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19950221	181	4250	4069.0			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19960206	181.38	4250	4068.6			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19970219	177.85	4250	4072.2			02S.07W.17.133	34.134722	-107.5936	
340805107353701	19980211	181.48	4250	4068.5			02S.07W.17.133	34.134722	-107.5936	
340805107353701	20010206	180.79	4250	4069.2			02S.07W.17.133	34.134722	-107.5936	

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340602107323101			4250				02S.07W.27.444 WARM WELL	34.100556	-107.5419	
340627107354401	19790510	157.75	4250	4092.3			02S.07W.30.242	34.1075	-107.5956	
340543107373901	19790510	160.9	4250	4089.1			02S.07W.31.113	34.095278	-107.6275	
340604106071001	19560126	755	4250	3495.0			02S.08E.29.443	34.101111	-106.1194	
341001107421501	19980706	260	4250	3990.0		380	02S.08W.06.214	34.166944	-107.7042	
341001107421501	20010206	259.55	4250	3990.5		380	02S.08W.06.214	34.166944	-107.7042	
340933107424501	19800501	276.62	4250	3973.4			02S.08W.06.314	34.159167	-107.7125	
340929107422301	19751115	267.93	4250	3982.1			02S.08W.06.431	34.158056	-107.7064	
340929107422301	19800430	268.92	4250	3981.1			02S.08W.06.431	34.158056	-107.7064	
340915107422801	19781115	267.93	4250	3982.1		360	02S.08W.06.433	34.154167	-107.7078	
340915107422801	19790215	268.08	4250	3981.9		360	02S.08W.06.433	34.154167	-107.7078	
340915107422801	19800116	267.59	4250	3982.4		360	02S.08W.06.433	34.154167	-107.7078	
340915107422801	19800923	267.66	4250	3982.3		360	02S.08W.06.433	34.154167	-107.7078	
340915107422801	19900130	272.68	4250	3977.3		360	02S.08W.06.433	34.154167	-107.7078	
340828107423101	19800501	279	4250	3971.0			02S.08W.07.344	34.141111	-107.7086	
340740107373601	19790523	184	4250	4066.0			02S.08W.13.330	34.127778	-107.6267	
340656107401401			4250				02S.08W.21.413	34.115556	-107.6706	
340549107374901	19790509	167.79	4250	4082.2			02S.08W.35.222	34.096944	-107.6303	
341218106552202			4250		Rio Grande	88	03010122442A	34.205	-106.9228	
340933106543501			4250		Rio Grande	60	3020102434	34.159167	-106.9097	
340634107142001			4250			340	3020427241	34.109444	-107.2389	
340341106534801			4250		Rio Grande	200	3030112324	34.061389	-106.8967	
343103106482701	19840703	92	4250	4158.0	Rio Grande	249	03N.01E.02.23	34.5175	-106.8075	
343028106523701	19700330	52	4250	4198.0	Rio Grande	212	03N.01E.06.433	34.507778	-106.8769	
342900106484701	19810424	60	4250	4190.0	Rio Grande	90	03N.01E.14.300	34.483333	-106.8131	
342911106504001	193911	334	4250	3916.0	Rio Grande	585	03N.01E.16.144	34.486389	-106.8444	
342911106504001	19391101	334	4250	3916.0	Rio Grande	585	03N.01E.16.144	34.486389	-106.8444	
342753106485501	19950411	9.74	4250	4240.3	Rio Grande	210	03N.01E.23.331	34.464722	-106.8153	
342733106472001			4250		Rio Grande	117	03N.01E.25.000	34.459167	-106.7889	
342623106493901			4250		Rio Grande		03N.01E.34.32	34.439722	-106.8275	
342630106492101			4250		Rio Grande		03N.01E.34.410	34.441667	-106.8225	
342629106493901	194806	20	4250	4230.0	Rio Grande		03N.01E.34.430A	34.441389	-106.8275	
342629106493901	19480601	20	4250	4230.0	Rio Grande		03N.01E.34.430A	34.441389	-106.8275	

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342653106475801	19560427	6.42	4250	4243.6	Rio Grande	100	03N.01E.36.111	34.448056	-106.7994	1460[b]
342653106475801	19570131	6.38	4250	4243.6	Rio Grande	100	03N.01E.36.111	34.448056	-106.7994	
342653106475801	19580116	5.89	4250	4244.1	Rio Grande	100	03N.01E.36.111	34.448056	-106.7994	
342653106475801	19590128	5.81	4250	4244.2	Rio Grande	100	03N.01E.36.111	34.448056	-106.7994	
342653106475801	19600125	6.12	4250	4243.9	Rio Grande	100	03N.01E.36.111	34.448056	-106.7994	
343053106551801			4250		Rio Grande	440	03N.01W.02.311	34.514722	-106.9217	
342922106550301	19800529	113.82	4250	4136.2	Rio Grande	143	03N.01W.14.114	34.489444	-106.9175	1[b]
342922106550301	19850207	113.26	4250	4136.7	Rio Grande	143	03N.01W.14.114	34.489444	-106.9175	
342922106550301	19900124	114.22	4250	4135.8	Rio Grande	143	03N.01W.14.114	34.489444	-106.9175	
342922106550301	19950209	112.47	4250	4137.5	Rio Grande	143	03N.01W.14.114	34.489444	-106.9175	
342922106550301	20000203	112.37	4250	4137.6	Rio Grande	143	03N.01W.14.114	34.489444	-106.9175	
342802106572401	19800528	352	4250	3898.0	Rio Grande	405	03N.01W.21.332	34.467222	-106.9567	
342707106532202	19850207	34.45	4250	4215.6	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19860108	34.42	4250	4215.6	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19870319	34.8	4250	4215.2	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19880115	34.27	4250	4215.7	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19890921	34.57	4250	4215.4	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19900124		4250		Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19910207	34.6	4250	4215.4	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19920206	34.37	4250	4215.6	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19930202	34.44	4250	4215.6	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19950208	34.43	4250	4215.6	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	19970128	34.85	4250	4215.2	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532202	20000203	34.4	4250	4215.6	Rio Grande	61	03N.01W.25.441	34.451944	-106.8894	
342707106532201	19491121	34.97	4250	4215.0	Rio Grande	70	03N.01W.25.444	34.451944	-106.8894	
342707106532201	19810130	35.26	4250	4214.7	Rio Grande	70	03N.01W.25.444	34.451944	-106.8894	
342609106583501	19491221	16.5	4250	4233.5	Rio Grande		03N.01W.31.440	34.435833	-106.9764	
342613106543701	19491121	173.92	4250	4076.1	Rio Grande	186	03N.01W.35.430	34.436944	-106.9103	
343048106425601	19561127	100	4250	4150.0	Rio Grande	163	03N.02E.03.312	34.513333	-106.7156	1330[b]
343117106444301	19561127	65.89	4250	4184.1	Rio Grande		03N.02E.04.121	34.521389	-106.7453	2000[b]
343112106441001			4250				03N.02E.04.210	34.52	-106.7361	
343024106443101	19920726	150	4250	4100.0	Rio Grande	350	03N.02E.09.11	34.506667	-106.7419	
342915106445001	19950123	152.45	4250	4097.6	Rio Grande	355	03N.02E.16.130	34.484722	-106.7436	

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342853106454101	19811211	38	4250	4212.0	Rio Grande	170	03N.02E.17.332	34.481389	-106.7614	50[b]
342704106423401	19491207	243.81	4250	4006.2	Rio Grande		03N.02E.26.330	34.451111	-106.7094	
342740106432301	19800530	120.6	4250	4129.4	Rio Grande	380	03N.02E.27.123	34.461111	-106.7231	
342717106510401	198304	220	4250	4030.0	Rio Grande	250	03N.02E.28.311	34.454722	-106.8511	
342717106510401	19830401	220	4250	4030.0	Rio Grande	250	03N.02E.28.311	34.454722	-106.8511	
342717106510401	19830410	216.9	4250	4033.1	Rio Grande	250	03N.02E.28.311	34.454722	-106.8511	
342719106511901			4250		Rio Grande	385	03N.02E.29.421	34.455278	-106.8553	
342728106462401	19490901	21.47	4250	4228.5	Rio Grande		03N.02E.30.230	34.457778	-106.7733	
342607106464301			4250		Rio Grande		03N.02E.31.331	34.435278	-106.7786	
342608106464701	19951207	20	4250	4230.0	Rio Grande	258	03N.02E.31.333	34.435556	-106.7797	
342607106461901	19800611	100	4250	4150.0	Rio Grande		03N.02E.31.431	34.435278	-106.7719	
342650106430301	19800530	177.95	4250	4072.1	Rio Grande	320	03N.02E.33.222	34.447222	-106.7175	
342844107011201	19500106	26.65	4250	4223.4	Rio Grande		03N.02W.14.332	34.478889	-107.02	
343153107022401	19500106	18.43	4250	4231.6	Rio Grande		03N.02W.22.343	34.463333	-107.04	2.5[b]
342742107012601			4250		Rio Grande		03N.02W.26.112	34.461667	-107.0239	
342914106371901			4250		Rio Grande		03N.03E.15.131	34.487222	-106.6219	
342900106380201			4250		Rio Grande		03N.03E.16.410	34.483333	-106.6339	
342826106392001			4250		Rio Grande		03N.03E.20.	34.473889	-106.6556	
342624106384201	19800612	379.35	4250	3870.7	Rio Grande		03N.03E.32.310	34.44	-106.645	10[b]
342947107064901			4250		Rio Grande		03N.03W.12.313	34.496389	-107.1136	
342934107060401			4250		Rio Grande	630	03N.03W.12.443	34.492778	-107.1011	
342801107105401			4250				03N.03W.20.314	34.466944	-107.1817	
342717107060201			4250				03N.03W.25.412 BOUNDARY	34.454722	-107.1006	
342605107063001			4250				03N.03W.36.344 SECT 25 S	34.434722	-107.1083	
342723106312001	19800530	171.35	4250	4078.7	Rio Grande	192	03N.04E.28.244	34.456389	-106.5222	
343033107152901			4250				03N.04W.04.414	34.509167	-107.2581	
343012107151501			4250				03N.04W.09.223	34.503333	-107.2542	
342943107230401			4250				03N.05W.08.342	34.495278	-107.3844	
343117107281801	19810605	94.35	4250	4155.7		100	03N.06W.04.211	34.521389	-107.4717	
343114107281401	19810605	21.18	4250	4228.8		25	03N.06W.04.211A	34.520556	-107.4706	
342739107265501			4250				03N.06W.27.220	34.460833	-107.4486	
342722107281701			4250				03N.06W.28.	34.456111	-107.4714	
342736107284001	19560814	162	4250	4088.0			03N.06W.28.114	34.46	-107.4778	

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342638107261801			4250				03N.06W.35.142	34.443889	-107.4383	
343116107324801	19810520	293.47	4250	3956.5		330	03N.07W.02.112	34.521111	-107.5467	2.5[b]
342948107335501	19810603	166.29	4250	4083.7		242	03N.07W.10.313	34.496667	-107.5653	20[b]
342902107311201	19540330	73.27	4250	4176.7			03N.07W.13.412	34.483889	-107.52	17[b]
342902107311201	19850917	73.45	4250	4176.6			03N.07W.13.412	34.483889	-107.52	
342821107362401			4250			175	03N.07W.19.221	34.4725	-107.6067	
342802107313001	19750814	18.76	4250	4231.2			03N.07W.24.314	34.467222	-107.525	
342802107313001	19850917	18.7	4250	4231.3			03N.07W.24.314	34.467222	-107.525	
343003107392701	19810520	75.02	4250	4175.0		136	03N.08W.10.243	34.500833	-107.6575	5.3[b]
342615107372101	19810602	29.29	4250	4220.7		42	03N.08W.36.441	34.4375	-107.6225	
340437106510001	19630301	110	4250	4140.0	Rio Grande		03S.01E.04.314	34.076944	-106.85	
340436106523801			4250		Rio Grande		03S.01E.06.000	34.076667	-106.8772	
340504106525301	19520501	5	4250	4245.0	Rio Grande	8	03S.01E.06.121	34.084444	-106.8814	
340437106522301	19660301	8	4250	4242.0	Rio Grande		03S.01E.06.421	34.076944	-106.8731	
340340106530901	19590101	8	4250	4242.0	Rio Grande		03S.01E.07.313	34.061111	-106.8858	
340338106531101			4250		Rio Grande		03S.01E.07.314	34.060556	-106.8864	
340255106510401			4250		Rio Grande	112	03S.01E.16.311	34.048611	-106.8511	
340247106520801	19660301	13	4250	4237.0	Rio Grande	120	03S.01E.17.313	34.046389	-106.8689	
340300106530901	19660301	15	4250	4235.0	Rio Grande	100	03S.01E.18.133	34.05	-106.8858	2000[b]
340258106524801	19510101	8	4250	4242.0	Rio Grande	85	03S.01E.18.144	34.049444	-106.88	
340236106524701	19620601	7	4250	4243.0	Rio Grande		03S.01E.18.344	34.043333	-106.8797	
340221106524901	19590301	20	4250	4230.0	Rio Grande	90	03S.01E.19.124	34.039167	-106.8803	
340210106524701	19590301	15	4250	4235.0	Rio Grande	113	03S.01E.19.144	34.036111	-106.8797	
340147106513801			4250		Rio Grande		03S.01E.20.400	34.029722	-106.8606	
340204106511201	19660301	64	4250	4186.0	Rio Grande	150	03S.01E.20.422	34.034444	-106.8533	1000[b]
340224106485201			4250		Rio Grande		03S.01E.23.11 PUEBLITO W	34.04	-106.8144	
340122106473301	19830330	30	4250	4220.0	Rio Grande	60	03S.01E.25.142	34.022778	-106.7925	20[b]
340129106520001	19660301	9	4250	4241.0	Rio Grande		03S.01E.29.114	34.024722	-106.8667	
340124106525201			4250		Rio Grande		03S.01E.30.100	34.023333	-106.8811	
340058106522301			4250		Rio Grande		03S.01E.30.400	34.016111	-106.8731	
340039106524701	19630201	8	4250	4242.0	Rio Grande	75	03S.01E.31.124	34.010833	-106.8797	
340448106535701			4250		Rio Grande		03S.01W.01.100A	34.08	-106.8992	
340448106535702			4250		Rio Grande		03S.01W.01.100B	34.08	-106.8992	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
340502106535601			4250		Rio Grande	250	03S.01W.01.121	34.083889	-106.8989	
340505106534501			4250		Rio Grande		03S.01W.01.122	34.084722	-106.8958	
340506106532601	19650301	10	4250	4240.0	Rio Grande	30	03S.01W.01.221	34.085	-106.8906	
340423106532501			4250		Rio Grande		03S.01W.01.400	34.073056	-106.8903	
340450106543001			4250		Rio Grande		03S.01W.02.241A	34.080556	-106.9083	
340422106550001			4250		Rio Grande		03S.01W.02.300A	34.072778	-106.9167	
340422106550002			4250		Rio Grande		03S.01W.02.300B	34.072778	-106.9167	
340422106543001			4250		Rio Grande		03S.01W.02.400	34.072778	-106.9083	
340430106544001			4250		Rio Grande		03S.01W.02.414A	34.075	-106.9111	
340417106543701			4250		Rio Grande		03S.01W.02.430	34.071389	-106.9103	
340420106543501			4250		Rio Grande		03S.01W.02.432	34.072222	-106.9097	
340418106543301			4250		Rio Grande		03S.01W.02.443	34.071667	-106.9092	
340419106560101	19660301	70	4250	4180.0	Rio Grande		03S.01W.03.344	34.071944	-106.9336	
340410106563501	19660301	54	4250	4196.0	Rio Grande		03S.01W.09.222	34.069444	-106.9431	
340357106552401			4250		Rio Grande		03S.01W.10.200	34.065833	-106.9233	
340348106553401	19660301	148	4250	4102.0	Rio Grande	185	03S.01W.10.243	34.063333	-106.9261	100[b]
340356106550001			4250		Rio Grande		03S.01W.11.100	34.065556	-106.9167	
340405106551201			4250		Rio Grande		03S.01W.11.114	34.068056	-106.92	
340400106550501			4250		Rio Grande		03S.01W.11.132	34.066667	-106.9181	
340352106551401			4250		Rio Grande		03S.01W.11.133	34.064444	-106.9206	
340403106544501			4250		Rio Grande		03S.01W.11.200	34.0675	-106.9125	
340355106543001			4250		Rio Grande		03S.01W.11.200+DUP	34.065278	-106.9083	
340412106544101	19660801	74	4250	4176.0	Rio Grande	120	03S.01W.11.211	34.07	-106.9114	350[b]
340413106543501	19651101	54	4250	4196.0	Rio Grande	117	03S.01W.11.212	34.070278	-106.9097	400[c]
340406106543201	19510101	90	4250	4160.0	Rio Grande	112	03S.01W.11.214	34.068333	-106.9089	
340358106542801			4250		Rio Grande		03S.01W.11.242	34.066111	-106.9078	
340330106550101			4250		Rio Grande		03S.01W.11.300	34.058333	-106.9169	
340340106550501			4250		Rio Grande		03S.01W.11.314A	34.061111	-106.9181	
340340106550502			4250		Rio Grande		03S.01W.11.314B	34.061111	-106.9181	
340340106551201			4250		Rio Grande		03S.01W.11.332A	34.061111	-106.92	
340340106551202			4250		Rio Grande		03S.01W.11.332B	34.061111	-106.92	
340326106545601			4250		Rio Grande		03S.01W.11.344	34.057222	-106.9156	
340330106542901			4250		Rio Grande		03S.01W.11.400	34.058333	-106.9081	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
340347106543101			4250		Rio Grande		03S.01W.11.421	34.063056	-106.9086	
340355106532401			4250		Rio Grande		03S.01W.12.200	34.065278	-106.89	
340340106534701	19510101	30	4250	4220.0	Rio Grande	197	03S.01W.12.324	34.061111	-106.8964	
340334106540201			4250		Rio Grande		03S.01W.12.332 BLM-SOCOR	34.059444	-106.9006	
340320106534901			4250		Rio Grande		03S.01W.13.122	34.055556	-106.8969	
340316106535101			4250		Rio Grande		03S.01W.13.124	34.054444	-106.8975	
340319106533501			4250		Rio Grande		03S.01W.13.212	34.055278	-106.8931	
340317106534501	19510101	50	4250	4200.0	Rio Grande	117	03S.01W.13.213	34.054722	-106.8958	
340300106532701			4250		Rio Grande		03S.01W.13.243A	34.05	-106.8908	
340237106535801			4250		Rio Grande		03S.01W.13.300	34.043611	-106.8994	
340255106541301	19660301	119	4250	4131.0	Rio Grande	140	03S.01W.13.311	34.048611	-106.9036	
340237106532401			4250		Rio Grande		03S.01W.13.400A	34.043611	-106.89	
340237106532402			4250		Rio Grande		03S.01W.13.400B	34.043611	-106.89	
340253106534101			4250		Rio Grande		03S.01W.13.411	34.048056	-106.8947	
340257106542401			4250		Rio Grande		03S.01W.13.422	34.049167	-106.9067	
340320106544901			4250		Rio Grande		03S.01W.14.122	34.055556	-106.9136	
340318106542501			4250		Rio Grande		03S.01W.14.221	34.055	-106.9069	
340239106540501			4250		Rio Grande		03S.01W.14.244	34.044167	-106.9014	
340237106550001			4250		Rio Grande		03S.01W.14.300	34.043611	-106.9167	
340254106551601			4250		Rio Grande		03S.01W.14.311	34.048333	-106.9211	
340237106543001			4250		Rio Grande		03S.01W.14.400A	34.043611	-106.9083	
340237106543002			4250		Rio Grande		03S.01W.14.400B	34.043611	-106.9083	
340258106545901	19750916	165.5	4250	4084.5	Rio Grande	200	03S.01W.14.4112	34.049444	-106.9164	
340258106545901	19770228	166.39	4250	4083.6	Rio Grande	200	03S.01W.14.4112	34.049444	-106.9164	
340258106545901	19790208	164.94	4250	4085.1	Rio Grande	200	03S.01W.14.4112	34.049444	-106.9164	
340258106545901	19800220	165.1	4250	4084.9	Rio Grande	200	03S.01W.14.4112	34.049444	-106.9164	
340258106545901	19810309	163.61	4250	4086.4	Rio Grande	200	03S.01W.14.4112	34.049444	-106.9164	
340258106545901	19820330	167.94	4250	4082.1	Rio Grande	200	03S.01W.14.4112	34.049444	-106.9164	
340258106545901	19850205	163.38	4250	4086.6	Rio Grande	200	03S.01W.14.4112	34.049444	-106.9164	
340255106542501			4250		Rio Grande		03S.01W.14.421	34.048611	-106.9069	
340306106562001			4250		Rio Grande		03S.01W.15.131 SMITH WEL	34.051667	-106.9389	
340312106553401			4250		Rio Grande		03S.01W.15.200	34.053333	-106.9261	
340239106560601			4250		Rio Grande		03S.01W.15.300	34.044167	-106.935	

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340254106561601			4250		Rio Grande		03S.01W.15.3114	34.048333	-106.9378	
340248106570301			4250		Rio Grande		03S.01W.16.323	34.046667	-106.9508	20[b,c]
340250106564701	19790409	23	4250	4227.0	Rio Grande	80	03S.01W.16.410	34.047222	-106.9464	30[b]
340250106544501			4250		Rio Grande		03S.01W.21.000	34.047222	-106.9125	
340218106571101	19751031	55	4250	4195.0	Rio Grande	125	03S.01W.21.100	34.038333	-106.9531	100[b]
340230106561801			4250		Rio Grande		03S.01W.22.111	34.041667	-106.9383	
340226106561801			4250		Rio Grande		03S.01W.22.112 SOCORRO S	34.041111	-106.9375	
340216106561901			4250		Rio Grande		03S.01W.22.1131	34.037778	-106.9386	
340223106562301			4250		Rio Grande		03S.01W.22.131 SEDILLO S	34.039722	-106.9397	
340204106545001	19610315	230	4250	4020.0	Rio Grande	302	03S.01W.23.000	34.034444	-106.9139	
340203106550701	19850205	261.22	4250	3988.8	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19860113	262.19	4250	3987.8	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19880115	260.69	4250	3989.3	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19890921	263.25	4250	3986.8	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19900126	261.4	4250	3988.6	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19910207	261.58	4250	3988.4	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19910717	261.47	4250	3988.5	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19920204	261.14	4250	3988.9	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19930203	260.79	4250	3989.2	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19950206	261.11	4250	3988.9	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	19970128	261.85	4250	3988.2	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340203106550701	20010315	261.29	4250	3988.7	Rio Grande		03S.01W.23.312	34.034167	-106.9186	
340154106541801			4250		Rio Grande		03S.01W.23.424	34.030833	-106.905	
340210106532201			4250		Rio Grande		03S.01W.24.200	34.036111	-106.8894	
340142106532401			4250		Rio Grande		03S.01W.24.400A	34.028333	-106.89	
340142106532402			4250		Rio Grande		03S.01W.24.400B	34.028333	-106.89	
340128106534301			4250		Rio Grande		03S.01W.25.200	34.024444	-106.8953	
340122106533501	19621101	186	4250	4064.0	Rio Grande	220	03S.01W.25.233	34.022778	-106.8931	
340111106551501	19510101	370	4250	3880.0	Rio Grande	440	03S.01W.26.311	34.019722	-106.9208	100[b]
340133106554401	19571003	131	4250	4119.0	Rio Grande	160	03S.01W.27.210	34.025833	-106.9289	
340100106560601			4250		Rio Grande		03S.01W.27.300	34.016667	-106.935	
340100106560001			4250		Rio Grande		03S.01W.27.300A	34.016667	-106.9333	
340100106560002			4250		Rio Grande		03S.01W.27.300B	34.016667	-106.9333	

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340058106561101	19611110	340	4250	3910.0	Rio Grande	546	03S.01W.27.332	34.016111	-106.9364	
340028106573501			4250		Rio Grande		03S.01W.32.240	34.007778	-106.9597	
340029106572401	19560116	13.02	4250	4237.0	Rio Grande		03S.01W.33.130	34.008056	-106.9567	
340025106570901			4250		Rio Grande		03S.01W.33.143 SEDILLO A	34.006944	-106.9525	
340024106570001			4250		Rio Grande		03S.01W.33.144	34.006667	-106.95	
340040106541101			4250		Rio Grande		03S.01W.36.113 BURRIS WE	34.011111	-106.9031	
340344106445701			4250		Rio Grande		03S.02E.08.422 TREMENTIN	34.062222	-106.7492	
340152106463801			4250		Rio Grande		03S.02E.19.314	34.031111	-106.7772	
340040106464601			4250		Rio Grande		03S.02E.31.11 OWL WELL	34.011111	-106.7794	
340430107001601			4250		Rio Grande		03S.02W.01.323	34.075	-107.0044	
340341107035701			4250		La Jencia		03S.02W.08.423	34.061389	-107.0658	
340340107035001	19600601	355	4250	3895.0	La Jencia	400	03S.02W.08.424	34.061111	-107.0639	
340248107035801	19600601	380	4250	3870.0	La Jencia	400	03S.02W.17.423	34.046667	-107.0661	
340229107044501	19600601	440	4250	3810.0	La Jencia	540	03S.02W.20.111	34.041389	-107.0792	
340220107011501	19770801	112	4250	4138.0	Rio Grande	173	03S.02W.23.123	34.038889	-107.0208	
340210107011101			4250		Rio Grande	100	03S.02W.23.144	34.036111	-107.0197	
340143107003801	19510101	50	4250	4200.0	Rio Grande	100	03S.02W.23.444	34.028611	-107.0106	
340141107011001	19510101	30	4250	4220.0	Rio Grande	310	03S.02W.23.444A	34.028056	-107.0194	
340140107003301			4250		Rio Grande		03S.02W.25.111	34.027778	-107.0092	
340139107003101	19620717	124	4250	4126.0	Rio Grande		03S.02W.25.111+DUP	34.0275	-107.0086	
340138106595001	19660401	28	4250	4222.0	Rio Grande		03S.02W.25.212	34.027222	-106.9972	
340050106595201			4250		Rio Grande		03S.02W.25.443	34.013889	-106.9978	
340136107004601	19560116	36	4250	4214.0	Rio Grande		03S.02W.26.220	34.026667	-107.0128	
340138107004101	19670701	120	4250	4130.0	Rio Grande	180	03S.02W.26.222	34.027222	-107.0114	
340136107082601			4250				03S.02W.27.211	34.026667	-107.1406	
340047107001301			4250		Rio Grande		03S.02W.36.212 SEDILLO A	34.013056	-107.0036	
340500106390101	19650603	184	4250	4066.0		315	03S.03E.05.213	34.083333	-106.6503	60[b]
340215106402201	19850204	5.36	4250	4244.6			03S.03E.19.141	34.0375	-106.6728	
340215106402201	19900130	19.2	4250	4230.8			03S.03E.19.141	34.0375	-106.6728	
340215106402201	19900131	19.2	4250	4230.8			03S.03E.19.141	34.0375	-106.6728	
340215106402201	19950206	16.91	4250	4233.1			03S.03E.19.141	34.0375	-106.6728	
335959106375801	19830106	37	4250	4213.0		223	03S.03E.33.430	33.999722	-106.6328	75[b]
340506107061001	19670801	391	4250	3859.0	La Jencia		03S.03W.01.212	34.085	-107.1028	

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340440107084201	19620701	57	4250	4193.0			03S.03W.03.312	34.077778	-107.145	
340342107120001			4250				03S.03W.07.313	34.061667	-107.2	
340344107115501			4250				03S.03W.07.313MINE WATER	34.062222	-107.1986	
340334107114001			4250				03S.03W.07.342	34.059444	-107.1944	
340400107080701			4250			150	03S.03W.10.241	34.066667	-107.1353	
340349107085501			4250				03S.03W.10.311	34.063611	-107.1486	
340349107081101	19670701	88	4250	4162.0		150	03S.03W.10.412	34.063611	-107.1364	
340350107075601	19670701	175	4250	4075.0		1850	03S.03W.10.422	34.063889	-107.1322	
340340107074901	19670701	470	4250	3780.0		660	03S.03W.11.313	34.061111	-107.1303	
340256107063401	19660401	74	4250	4176.0	La Jencia		03S.03W.13.321	34.048889	-107.1094	
340241107064701	19670701	76	4250	4174.0			03S.03W.13.331	34.044722	-107.1131	
340212107115001			4250				03S.03W.19.132	34.036667	-107.1972	
340210107100701			4250				03S.03W.20.421 SPRING 66	34.036111	-107.1686	
340153107094101	19670701	20	4250	4230.0		61	03S.03W.21.332	34.031389	-107.1614	
340144107093201			4250				03S.03W.21.344 SPRING 66	34.028889	-107.1589	
340229107071101	19600601	70	4250	4180.0		95	03S.03W.23.212	34.041389	-107.1197	
340229107070501	19670701	59	4250	4191.0		85	03S.03W.23.221	34.041389	-107.1181	
340150107072601	19660401	5	4250	4245.0		40	03S.03W.23.342	34.030556	-107.1239	
340156107072001	19770830	38	4250	4212.0		125	03S.03W.23.413	34.032222	-107.1222	
340138107064901			4250				03S.03W.25.111	34.027222	-107.1136	
340135107074701			4250				03S.03W.26.111	34.026389	-107.1297	
340130107075201			4250				03S.03W.26.113	34.025	-107.1311	
340134107081501			4250				03S.03W.27.212 SPRING 66	34.026111	-107.1375	
340058107085001	19840727	60	4250	4190.0		115	03S.03W.27.331	34.016111	-107.1472	5[b]
340058107080401			4250				03S.03W.27.441 SPRING 66	34.016111	-107.1344	
340105107090301			4250				03S.03W.28.424	34.018056	-107.1508	
340006107090101			4250				03S.03W.33.442 SPRING 66	34.001667	-107.1503	
340008107084801			4250				03S.03W.34.332	34.002222	-107.1467	
340500107132901	19510101	63	4250	4187.0		68	03S.04W.02.211	34.083333	-107.2247	
340425107141801	19780719	70	4250	4180.0		200	03S.04W.03.441	34.073611	-107.2383	
340355107152801	19780712	94	4250	4156.0		145	03S.04W.09.230	34.065278	-107.2578	8[b]
340406107140501	19791210	130	4250	4120.0		195	03S.04W.10.224	34.068333	-107.2347	5[b]
340353107140001	19840725	78	4250	4172.0		100	03S.04W.11.133	34.064722	-107.2333	50[b]

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340339107133901	19620601	9	4250	4241.0			03S.04W.11.324	34.060833	-107.2275	
340328107134001			4250			182	03S.04W.11.341 HERTZ WEL	34.057778	-107.2278	
340402107124501			4250				03S.04W.12.132	34.067222	-107.2125	
340348107130001			4250				03S.04W.12.311	34.063333	-107.2167	
340250107131001	19791220	68	4250	4182.0		210	03S.04W.14.420	34.047222	-107.2194	
340215107120501			4250				03S.04W.24.242	34.0375	-107.2014	
340210107120301			4250				03S.04W.24.242 HOP CANYO	34.036111	-107.2008	
340128107155702			4250				03S.04W.28.114B	34.024444	-107.2658	
340252106244301			4250				03S.05E.15.322 A FERNAND	34.047778	-106.4119	
340130106234201			4250				03S.05E.26.120 MWC WELL	34.025	-106.395	
340038106274101	19850207	136.44	4250	4113.6		147	03S.05E.31.213	34.010556	-106.4614	
340038106274101	19900131	136.8	4250	4113.2		147	03S.05E.31.213	34.010556	-106.4614	
340038106274101	19950207	136.8	4250	4113.2		147	03S.05E.31.213	34.010556	-106.4614	
340437107191701	19780712	89.05	4250	4161.0			03S.05W.02.422	34.076944	-107.3214	
340229107192801	19780712	386.28	4250	3863.7			03S.05W.14.443	34.041389	-107.3244	
340146107240101	19781213	31.44	4250	4218.6			03S.05W.19.323	34.029444	-107.4003	
340107107211601	19780712	546.86	4250	3703.1			03S.05W.27.311	34.018611	-107.3544	
340028107234301	19780712	26.87	4250	4223.1			03S.05W.31.223	34.007778	-107.3953	
340438106195701			4250				03S.06E.05.422 C P WILSO	34.077222	-106.3325	
340453107261801			4250				03S.06W.02.113	34.081389	-107.4383	
340453107261802	19790425	298.28	4250	3951.7			03S.06W.02.113A	34.081389	-107.4383	
340353107255301	19780613	210.03	4250	4040.0			03S.06W.11.231	34.064722	-107.4314	
340351107255401			4250				03S.06W.11.241 DIVIDE WE	34.064167	-107.4317	
340216107281801	19780714	228.53	4250	4021.5			03S.06W.21.111	34.037778	-107.4717	
340124107290301	19780714	269.46	4250	3980.5			03S.06W.29.122	34.023333	-107.4842	
340011107261501	19780713	67.85	4250	4182.2			03S.06W.35.312	34.003056	-107.4375	
340008107251201	19800624	68.62	4250	4181.4			03S.06W.36.312	34.002222	-107.42	
340458106134401			4250				03S.07E.05.220	34.082778	-106.2289	
340451107302501	19790425	209.11	4250	4040.9			03S.07W.01.222	34.080833	-107.5069	
340421107304501	19800502	176.71	4250	4073.3			03S.07W.01.414	34.0725	-107.5125	
340409107344601	19790510	203.4	4250	4046.6		221	03S.07W.05.443	34.069167	-107.5794	
340347107351401			4250				03S.07W.08.132 CCC WELL	34.063056	-107.5872	
340349107350601	19790510	227.72	4250	4022.3			03S.07W.08.231	34.063611	-107.585	

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340326107303701	19800509	208.27	4250	4041.7			03S.07W.12.423	34.057222	-107.5103	
340326107303701	19910212	209.11	4250	4040.9			03S.07W.12.423	34.057222	-107.5103	
340326107303701	19920217	185.4	4250	4064.6			03S.07W.12.423	34.057222	-107.5103	
340326107303701	19930222	211.4	4250	4038.6			03S.07W.12.423	34.057222	-107.5103	
340326107303701	19940224	185.67	4250	4064.3			03S.07W.12.423	34.057222	-107.5103	
340326107303701	19950221	215.48	4250	4034.5			03S.07W.12.423	34.057222	-107.5103	
340326107303701	19960208	209.63	4250	4040.4			03S.07W.12.423	34.057222	-107.5103	
340326107303701	19980211	196.39	4250	4053.6			03S.07W.12.423	34.057222	-107.5103	
340225107340001	19800508	322.21	4250	3927.8		355	03S.07W.16.433	34.040278	-107.5667	
340225107340001	19960208	331.19	4250	3918.8		355	03S.07W.16.433	34.040278	-107.5667	
340225107340001	20010206		4250			355	03S.07W.16.433	34.040278	-107.5667	
340141106052101	19670728	810	4250	3440.0		842	03S.08E.22.344	34.028056	-106.0892	
340427107373601	19800502	174.3	4250	4075.7			03S.08W.01.310	34.074167	-107.6267	
340427107373601	19910221	175.15	4250	4074.9			03S.08W.01.310	34.074167	-107.6267	
340427107373601	19960208	174.91	4250	4075.1			03S.08W.01.310	34.074167	-107.6267	
340427107373601	20010206	175.14					03S.08W.01.310	34.074167	-107.6267	
340424107372701							03S.08W.01.310 VLA MAIN	34.073333	-107.6242	
340414107381301	19500810	172.45					03S.08W.02.433	34.070556	-107.6369	
340238107382301	19790508	243.1					03S.08W.14.323	34.043889	-107.6397	
340215107411801	19790508	168.72					03S.08W.20.211	34.0375	-107.6883	
340210107402001							03S.08W.21.100	34.036111	-107.6722	
340238107402301							03S.08W.21.124 JACK BRUT	34.043889	-107.6731	
340118107424201	19770224	167.6					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19780216	167.21					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19790215	167.73					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19800116	167.89					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19810317	167.72					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19900131	177.36					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19920217	167.66					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19930222	167.86					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19940224	167.25					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19950221	167.7					03S.08W.30.100	34.021667	-107.7117	
340118107424201	19970219	167.7					03S.08W.30.100	34.021667	-107.7117	

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340118107424201	20010206	168.18					03S.08W.30.100	34.021667	-107.7117	
340032107425101	19540101	162.3					03S.08W.31.111	34.008889	-107.7142	
340033107364001	19800506	583.2				620	03S.08W.36.222	34.009167	-107.6111	
335503106520801					Rio Grande	90	4040132311	33.9175	-106.8689	
343417106531001	19560509	53.29			Rio Grande		04N.01E.18.311	34.571389	-106.8861	
343124106530501	19600701	168			Rio Grande	203	04N.01E.31.330	34.523333	-106.8847	
343103106475701	19560328	6.52			Rio Grande		04N.01E.36.121	34.5175	-106.7992	1000[b]
343447106554201	19560509	224.79			Rio Grande		04N.01W.15.211	34.579722	-106.9283	4[b]
343230106570301	19560508	207.33			Rio Grande		04N.01W.28.323	34.541667	-106.9508	7.5[b]
343230106570301	19800603	212			Rio Grande		04N.01W.28.323	34.541667	-106.9508	
343145106533601	19491121	52.1			Rio Grande		04N.01W.36.140	34.529167	-106.8933	
343334107064501	19500525	240.44			Rio Grande		04N.03W.24.132	34.559444	-107.1125	
343209107065401					Rio Grande		04N.03W.25.334 COYOTE SP	34.535833	-107.115	
343152107073001					Rio Grande		04N.03W.35.211	34.531111	-107.125	
343258107173201							04N.04W.30.223	34.549444	-107.2922	
343403107233201	19810604	21.1				23.5	04N.05W.17.331	34.5675	-107.3922	4[b]
343215107220001							04N.05W.33.200	34.5375	-107.3667	
343208107215301							04N.05W.33.223	34.535556	-107.3647	
343407107265901							04N.06W.15.400	34.568611	-107.4497	
343410107263701							04N.06W.15.424	34.569444	-107.4436	
343410107263801							04N.06W.15.424 PINO PLAC	34.569444	-107.4439	
343233107262801							04N.06W.26.312	34.5425	-107.4411	
343218107270801						784	04N.06W.27.4314 BUDDY MA	34.538333	-107.4522	
343158107290801	19810605	-1				750	04N.06W.32.214	34.532778	-107.4856	15[b]
342800107290801							04N.06W.32.214+DUP	34.466667	-107.4856	
343350107352101	19810519	47.24				110	04N.07W.20.221	34.563889	-107.5892	6[b]
343122107370401						320	04N.07W.31.333	34.522778	-107.6178	
343142107342601	19810520	20.29				71	04N.07W.33.412	34.528333	-107.5739	7.2[b]
343308107382301	19810519	200.53				256	04N.08W.23.443A	34.552222	-107.6397	
343308107382302	19810519					186	04N.08W.23.443B	34.552222	-107.6397	
335905106470601	19650717	49			Rio Grande	71	04S.01E.01.440	33.984722	-106.785	
335907106480801	19660902	52			Rio Grande	77	04S.01E.02.440	33.985278	-106.8022	
335904106511601	19520501	22			Rio Grande	100	04S.01E.05.444	33.984444	-106.8544	

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335940106530001					Rio Grande		04S.01E.06.100	33.994444	-106.8833	
335930106531001	19550901	15			Rio Grande	40	04S.01E.06.133	33.991667	-106.8861	
335940106522701	19610331	10			Rio Grande	18	04S.01E.06.200	33.994444	-106.8742	4[b]
335858106530901	19640904	51			Rio Grande	85	04S.01E.07.111	33.982778	-106.8858	
335852106521301	19670303	42			Rio Grande	84	04S.01E.07.224	33.981111	-106.8703	
335818106525501	19670615	83			Rio Grande	125	04S.01E.07.340	33.971667	-106.8819	
335823106523901	19760917	55			Rio Grande	100	04S.01E.07.413	33.973056	-106.8775	30[b]
335822106524001	19761001	73			Rio Grande	125	04S.01E.07.413+DUP	33.972778	-106.8778	
335903106511701	19950420	9.51			Rio Grande	92	04S.01E.08.221	33.984167	-106.8547	
335837106511101					Rio Grande		04S.01E.08.244 FAZIO WEL	33.976944	-106.8531	
335834106511401	19520501	8			Rio Grande	22	04S.01E.08.422	33.976111	-106.8539	
335829106511101					Rio Grande		04S.01E.08.422 FAZIO-KEN	33.974722	-106.8531	
335829106511601					Rio Grande		04S.01E.08.422 FAZIO-KEN	33.974722	-106.8544	
335816106470801	19640520	120			Rio Grande	177	04S.01E.12.440	33.971111	-106.7856	
335741106504501	19520523	14			Rio Grande		04S.01E.16.322	33.961389	-106.8458	
335752106512501					Rio Grande		04S.01E.17.200	33.964444	-106.8569	
335727106530001					Rio Grande		04S.01E.18.400	33.9575	-106.8833	
335703106521501	19800703	33.5			Rio Grande	47	04S.01E.19.242	33.950833	-106.8708	
335653106522001	19791006	48			Rio Grande	95	04S.01E.19.243	33.948056	-106.8722	
335645106522001	19760116	35			Rio Grande	132	04S.01E.19.420	33.945833	-106.8722	
335640106520901	19640815	9	4250	4241.0	Rio Grande	137	04S.01E.20.313	33.944444	-106.8692	
335630106513501	19510912	6	4241.6	4235.6	Rio Grande	89	04S.01E.20.430	33.943056	-106.8597	
335704106501601			4241.6		Rio Grande		04S.01E.21.241 VIGIL WEL	33.951111	-106.8378	
335620106495601	19520501	10	4241.6	4231.6	Rio Grande		04S.01E.27.110	33.938889	-106.8322	
335549106511801			4241.6		Rio Grande		04S.01E.29.424 RANCHO AL	33.930278	-106.855	
335545106525001	19610711	12	4241.6	4229.6	Rio Grande	154	04S.01E.30.400	33.929167	-106.8744	1800[b]
335519106512201	19840216	30	4241.6	4211.6	Rio Grande	85	04S.01E.32.200	33.921944	-106.8561	70[b]
335507106511801	19570508	7	4241.6	4234.6	Rio Grande	100	04S.01E.32.240	33.918611	-106.855	
335455106503601			4241.6		Rio Grande		04S.01E.33.400	33.915278	-106.8433	
335950106575001			4241.6		Rio Grande		04S.01W.05.211	33.997222	-106.9639	
335815106532601			4241.6		Rio Grande		04S.01W.12.443 KNOBLOCK	33.970833	-106.8906	
335747106531401	19641225	187	4241.6	4054.6	Rio Grande	232	04S.01W.13.244	33.963056	-106.8872	
335739106531401	19630128	190	4241.6	4051.6	Rio Grande	205	04S.01W.13.421	33.960833	-106.8872	

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335331106561201			4241.6		Rio Grande		04S.01W.22.112 MCA WELL	33.891944	-106.9367	
335716106554001	19510101	480	4241.6	3761.6	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	800[b,c]
335716106554001	19850206	481.4	4241.6	3760.2	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19860113	481.23	4241.6	3760.4	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19870319	481.1	4241.6	3760.5	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19880115	484.72	4241.6	3756.9	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19890921	481.05	4241.6	3760.6	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19900126	480.87	4241.6	3760.7	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19910207	481.06	4241.6	3760.5	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19920204		4241.6		Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19920206	480.83	4241.6	3760.8	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19930203	480.81	4241.6	3760.8	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19950214	480.4	4241.6	3761.2	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335716106554001	19970128	481.3	4241.6	3760.3	Rio Grande	570	04S.01W.22.212	33.954444	-106.9278	
335710106552501			4241.6		Rio Grande		04S.01W.22.220	33.952778	-106.9236	
335704106550001	19550624	400	4241.6	3841.6	Rio Grande	560	04S.01W.23.100	33.951111	-106.9167	250[b]
335626106422001	19850204	19.23	4241.6	4222.4		63	04S.02E.23.344	33.940556	-106.7056	2.5[b]
335626106422001	19900130	7.42	4241.6	4234.2		63	04S.02E.23.344	33.940556	-106.7056	
335626106422001	19900131	7.42	4241.6	4234.2		63	04S.02E.23.344	33.940556	-106.7056	
335626106422001	19950206	8.87	4241.6	4232.7		63	04S.02E.23.344	33.940556	-106.7056	
345539106454701			4241.6		Rio Grande		04S.02E.29.33 ONINE WELL	33.9275	-106.7631	
335503106431301	19550210	13.23	4241.6	4228.4		18	04S.02E.34.411	33.9175	-106.7203	14[b]
335933107022201			4241.6		Rio Grande	135	04S.02W.03.143	33.9925	-107.0394	
335926107022001			4241.6		Rio Grande		04S.02W.03.321	33.990556	-107.0389	
335900107051501			4241.6				04S.02W.07.211	33.983333	-107.0875	
335858107002701			4241.6		Rio Grande	300	04S.02W.12.112	33.982778	-107.0075	
335634106595201			4241.6		Rio Grande		04S.02W.24.431 MIERA WEL	33.942778	-106.9978	
335759106371401			4241.6				04S.03E.15.123 E. JONES	33.966389	-106.6206	
335909107105701			4241.6				04S.03W.06.442 BALDY SPR	33.985833	-107.1825	
345843107100901			4241.6				04S.03W.08.241	33.978611	-107.1692	
335838106340301			4241.6				04S.04E.07.143 PRAIRIE S	33.977222	-106.5675	
335648106295801	19850207	46.7	4241.6	4194.9		71	04S.04E.23.323	33.946667	-106.4994	
335648106295801	19900125	48.9	4241.6	4192.7		71	04S.04E.23.323	33.946667	-106.4994	

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[b]Roybal (1991)

[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
335648106295801	19900131	48.9	4241.6	4192.7		71	04S.04E.23.323	33.946667	-106.4994	
335648106295801	19950207	55.45	4241.6	4186.2		71	04S.04E.23.323	33.946667	-106.4994	
335915106244501	19100101	90	4241.6	4151.6		180	04S.05E.03.	33.9875	-106.4125	
335655106233601	19850207	74.75	4241.6	4166.9		79	04S.05E.23.411	33.948611	-106.3933	
335845107233601	19780713	167.12	4241.6	4074.5			04S.05W.07.224	33.979167	-107.3933	
335806107192801	19560118	34.74	4241.6	4206.9			04S.05W.11.443	33.968333	-107.3244	
335511107194701	19560117	400	4241.6	3841.6			04S.05W.35.231	33.919722	-107.3297	
335733106170101	19820703	75	4241.6	4166.6		102	04S.06E.14.400	33.959167	-106.2836	
335844107280601	19800623	148.95	4241.6	4092.7			04S.06W.09.123	33.978889	-107.4683	
335827107262601	19800623	96.1	4241.6	4145.5			04S.06W.10.244	33.974167	-107.4406	
335755107242901	19780713	214.36	4241.6	4027.2			04S.06W.13.224	33.965278	-107.4081	
335750107275501			4241.6				04S.06W.16.213 UPPER CAS	33.963889	-107.4653	
335726107294101	19800509	23.81	4241.6	4217.8			04S.06W.18.423	33.957222	-107.4947	
335851107310601	19780713	544.02	4241.6	3697.6			04S.07W.01.343	33.980833	-107.5183	
335900107343201	19800508	109.24	4241.6	4132.4			04S.07W.04.331	33.983333	-107.5756	
335900107343202	19800508	16.5	4241.6	4225.1			04S.07W.04.331A	33.983333	-107.5756	
335650107342101	19800507	12.2	4241.6	4229.4			04S.07W.21.132	33.947222	-107.5725	
335650107323801			4241.6				04S.07W.22.241	33.947222	-107.5439	
335648107322701	19800623	212.95	4241.6	4028.7			04S.07W.23.131	33.946667	-107.5408	
335856107374401	19800507	474	4241.6	3767.6			04S.08W.02.442	33.982222	-107.6289	
335904107404901	19770224	278.64	4241.6	3963.0			04S.08W.04.331	33.984444	-107.6803	
335904107404901	19910212	278.51	4241.6	3963.1			04S.08W.04.331	33.984444	-107.6803	
335543107372101	19800507	39.3	4241.6	4202.3			04S.08W.25.321	33.928611	-107.6225	
335441107411501	19800508	596.8	4241.6	3644.8			04S.08W.32.413	33.911389	-107.6875	
335435106470501	19650620	160	4241.6	4081.6	Rio Grande	195	05S.01E.01.220	33.909722	-106.7847	
335414106503601	19720711	32	4241.6	4209.6	Rio Grande	152	05S.01E.04.000	33.903889	-106.8433	
335435106504001	19621005	19.95	4241.6	4221.7	Rio Grande	60	05S.01E.04.122	33.910556	-106.8444	
335421106513601	19610602	8	4241.6	4233.6	Rio Grande	170	05S.01E.05.233	33.905833	-106.86	
335404106521701	19850205	11.1	4241.6	4230.5	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19860113	11.19	4241.6	4230.4	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19870317	10.1	4241.6	4231.5	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19880120	10.93	4241.6	4230.7	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19890307	11.1	4241.6	4230.5	Rio Grande		05S.01E.06.423	33.901111	-106.8714	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
335404106521701	19900125	11.24	4241.6	4230.4	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19910207	11.15	4241.6	4230.5	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19910717		4241.6		Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19920204	10.56	4241.6	4231.0	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19930204	11.32	4241.6	4230.3	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19950214	10.68	4241.6	4230.9	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335404106521701	19970128	11.83	4241.6	4229.8	Rio Grande		05S.01E.06.423	33.901111	-106.8714	
335326106522701	19920506	19	4241.6	4222.6	Rio Grande	84	05S.01E.07.234	33.890556	-106.8742	
335340106515201	19610612	3	4241.6	4238.6	Rio Grande	150	05S.01E.08.123	33.894444	-106.8644	2170[b]
335310106471401	19580122	99	4241.6	4142.6	Rio Grande	150	05S.01E.12.400	33.886111	-106.7872	
335243106500201			4241.6		Rio Grande		05S.01E.15.130	33.878611	-106.8339	
335219106501801	19670110	15	4241.6	4226.6	Rio Grande	100	05S.01E.16.400	33.871944	-106.8383	
335210106520801	19600714	12	4241.6	4229.6	Rio Grande	150	05S.01E.17.333	33.869444	-106.8689	
335220106515501	19580205	15	4241.6	4226.6	Rio Grande	149	05S.01E.17.344	33.872222	-106.8653	1125[b]
335212106514201	19800702	6.42	4241.6	4235.2	Rio Grande	125	05S.01E.17.344+DUP	33.87	-106.8617	
335215106532001	19580205	8	4241.6	4233.6	Rio Grande	125	05S.01E.18.300	33.872222	-106.8819	
335216106524001	19580205	23.63	4241.6	4218.0	Rio Grande		05S.01E.18.431	33.871111	-106.8778	
335152106512001	19580806	12	4241.6	4229.6	Rio Grande	127	05S.01E.20.241	33.864444	-106.8556	1420[b]
335152106512001	19850205	9.65	4241.6	4232.0	Rio Grande	127	05S.01E.20.241	33.864444	-106.8556	
335152106512001	19900125	7.35	4241.6	4234.3	Rio Grande	127	05S.01E.20.241	33.864444	-106.8556	
335152106512001	19950214	7.94	4241.6	4233.7	Rio Grande	127	05S.01E.20.241	33.864444	-106.8556	
335125106514701	19600623	9	4241.6	4232.6	Rio Grande	142	05S.01E.20.342	33.856944	-106.8631	
335037106495301			4241.6		Rio Grande		05S.01E.27.300	33.843611	-106.8314	
335106106510001	19580726	10	4241.6	4231.6	Rio Grande	114	05S.01E.28.111	33.851667	-106.85	
335100106500901	19850205	14.41	4241.6	4227.2	Rio Grande	50	05S.01E.28.212	33.85	-106.8358	
335100106500901	19900125	10.85	4241.6	4230.8	Rio Grande	50	05S.01E.28.212	33.85	-106.8358	
335100106500901	19950214	7.78	4241.6	4233.8	Rio Grande	50	05S.01E.28.212	33.85	-106.8358	
335030106505501	19580723	11	4241.6	4230.6	Rio Grande	115	05S.01E.28.331	33.841667	-106.8486	
335109106510801	19580726	10	4241.6	4231.6	Rio Grande	113	05S.01E.29.222	33.8525	-106.8522	
335024106514701	19600601	7	4241.6	4234.6	Rio Grande	142	05S.01E.29.310	33.84	-106.8631	
335032106514101	19600704	8	4241.6	4233.6	Rio Grande	142	05S.01E.29.342	33.842222	-106.8614	
335055106530401	19800702	29.75	4241.6	4211.9	Rio Grande	65	05S.01E.30.133	33.848611	-106.8844	2.5[b]
335104106522101	19600710	10	4241.6	4231.6	Rio Grande	142	05S.01E.30.223	33.851111	-106.8725	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
335058106522301	19600708	10	4241.6	4231.6	Rio Grande	142	05S.01E.30.241	33.849444	-106.8731	
335005106512801	19580717	13	4241.6	4228.6	Rio Grande	115	05S.01E.32.214	33.834722	-106.8578	
335004106514201	19580717	13	4241.6	4228.6	Rio Grande	115	05S.01E.32.234	33.834444	-106.8617	
334936106470401	19550208	284.87	4241.6	3956.7	Rio Grande	323	05S.01E.36.442	33.826667	-106.7844	
335356106540801	19610415	16	4241.6	4225.6	Rio Grande	60	05S.01W.01.330	33.898889	-106.9022	
335330106551101	19850205	9.65	4241.6	4232.0	Rio Grande	570	05S.01W.11.131	33.891667	-106.9197	
335330106551101	19850206	446.7	4241.6	3794.9	Rio Grande	570	05S.01W.11.131	33.891667	-106.9197	
335332106550801			4241.6		Rio Grande		05S.01W.11.132 PADILLA W	33.892222	-106.9189	
335037106531401	19850205	11.75	4241.6	4229.9	Rio Grande	42	05S.01W.25.422	33.843611	-106.8872	
335037106531401	19900125	12.32	4241.6	4229.3	Rio Grande	42	05S.01W.25.422	33.843611	-106.8872	
335107106544001	19580205	214	4241.6	4027.6	Rio Grande		05S.01W.26.213	33.851944	-106.9111	
335000106471501			4241.6		Rio Grande		05S.01W.36.200	33.833333	-106.8903	
335420106424101			4241.6				05S.02E.02.130	33.905556	-106.7114	
335336106425501			4241.6				05S.02E.10.220	33.893333	-106.7153	
335216106443001	19550207	127.75	4241.6	4113.9	Rio Grande	140	05S.02E.16.323	33.871111	-106.7417	5[b]
335220106445301			4241.6		Rio Grande		05S.02E.17.424	33.872222	-106.7481	
335415107042901			4241.6		Rio Grande		05S.02W.05.321	33.904167	-107.0747	
335325107041501			4241.6		Rio Grande		05S.02W.08.144 TORREON S	33.890278	-107.0708	
335237107021001	19850206	251.32	4241.6	3990.3	Rio Grande	360	05S.02W.15.144	33.876944	-107.0361	
335237107021001	19900129	251.54	4241.6	3990.1	Rio Grande	360	05S.02W.15.144	33.876944	-107.0361	
335237107021001	19950209	253.47	4241.6	3988.1	Rio Grande	360	05S.02W.15.144	33.876944	-107.0361	
335325106374001			4241.6				05S.03E.09.200	33.890278	-106.6278	
335349106382501			4241.6				05S.03E.09.244 JORNADA C	33.896944	-106.6403	
335227106342801			4241.6				05S.03E.13.200	33.874167	-106.5744	
335248106362801	19550210	171.62	4241.6	4070.0		237	05S.03E.14.111	33.88	-106.6078	5[b]
335250106394901	19550211	243.81	4241.6	3997.8		337	05S.03E.17.1113	33.880556	-106.6636	3[b]
335250106394901	19850204	244.45	4241.6	3997.2		337	05S.03E.17.1113	33.880556	-106.6636	
335250106394901	19900130	243.3	4241.6	3998.3		337	05S.03E.17.1113	33.880556	-106.6636	
335250106394901	19950206	243.7	4241.6	3997.9		337	05S.03E.17.1113	33.880556	-106.6636	
335108106350801	19550211	63.42	4241.6	4178.2		140	05S.03E.25.121	33.852222	-106.5856	2[b]
335030106381501			4241.6				05S.03E.28.400	33.841667	-106.6375	
335215106322001			4241.6				05S.04E.16.100	33.870833	-106.5389	
335212106322501	19550215	36.63	4241.6	4205.0			05S.04E.17.442	33.87	-106.5403	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
335235106333101	19550215	32.02	4241.6	4209.6		38	05S.04E.18.243	33.876389	-106.5586	1[b]
335111106322101	19550215	84.05	4241.6	4157.6			05S.04E.20.444	33.853056	-106.5392	
335310106224001			4241.6				05S.05E.12.400	33.886111	-106.3778	
335320106221801	19830124	174	4241.6	4067.6		248	05S.05E.12.410	33.888889	-106.3717	
335207106230401			4241.6				05S.05E.14.444	33.868611	-106.3844	
335142106273001	19550215	172.8	4241.6	4068.8			05S.05E.19.233	33.861667	-106.4583	
334926106261401	19550216	167.91	4241.6	4073.7			05S.05E.32.444	33.823889	-106.4372	
335321107213201	19560117	10	4241.6	4231.6			05S.05W.09.243	33.889167	-107.3589	
335241107201401	19560117	50	4241.6	4191.6			05S.05W.14.113	33.878056	-107.3372	
335137107182701	19560118	21.95	4241.6	4219.7			05S.05W.24.243	33.860278	-107.3075	
335054107193501	19780530	275	4241.6	3966.6		312	05S.05W.26.200	33.848333	-107.3264	10-15[b]
335410106191001	19850207	242.47	4241.6	3999.1		269	05S.06E.04.412	33.902778	-106.3194	
335410106191001	19900131	236.3	4241.6	4005.3		269	05S.06E.04.412	33.902778	-106.3194	
335410106191001	19950207	237.65	4241.6	4004.0		269	05S.06E.04.412	33.902778	-106.3194	
335145106181301	19560126	249.5	4241.6	3992.1			05S.06E.22.231	33.8625	-106.3036	
335029106171501	19831231	257	4241.6	3984.6		424	05S.06E.26.300	33.841389	-106.2875	
335006106203101			4241.6				05S.06E.32.123 BURREGO S	33.835	-106.3419	
335015107395701	19790830	770	4241.6	3471.6		915	05S.08W.33.200	33.8375	-107.6658	
334930105591001	19760209	109.4	4241.6	4132.2			05S.09E.34.343	33.825	-105.9861	
334930105591001	19810206	113.19	4241.6	4128.4			05S.09E.34.343	33.825	-105.9861	
334930105591001	19840207	115.47	4241.6	4126.1			05S.09E.34.343	33.825	-105.9861	
334835106405202			4241.6				06S.01E.01.400B	33.809722	-106.6811	
334850106502501	19660320	25.57	4241.6	4216.0	Rio Grande	255	06S.01E.04.414	33.813333	-106.8411	
334850106502501	19660617	25.57	4241.6	4216.0	Rio Grande	255	06S.01E.04.414	33.813333	-106.8411	
334902106513201	19800702	4.4	4241.6	4237.2	Rio Grande	170	06S.01E.05.233	33.817222	-106.8589	2000[b]
334836106520001			4241.6		Rio Grande		06S.01E.05.334 FIELD 17A	33.808333	-106.8653	
334821106523401	19800702	5.57	4241.6	4236.0	Rio Grande	100	06S.01E.07.213 WARM H2O	33.806667	-106.8761	
334825106513301	19670922	8.2	4241.6	4233.4	Rio Grande	255	06S.01E.08.211	33.810556	-106.8589	
334820106511801	19670526	13.65	4241.6	4228.0	Rio Grande	185	06S.01E.08.223	33.8075	-106.8542	300[b]
334807106513001	19670614	9.7	4241.6	4231.9	Rio Grande	115	06S.01E.08.413	33.801944	-106.8583	
334826106510401	19631115	20.65	4241.6	4221.0	Rio Grande	167	06S.01E.09.111	33.807222	-106.85	130[b]
334826106510402			4241.6		Rio Grande		06S.01E.09.111B	33.807222	-106.8511	
334826106510403			4241.6		Rio Grande		06S.01E.09.111C	33.807222	-106.8511	

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[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
334830106502201	19660628	41.2	4241.6	4200.4	Rio Grande	255	06S.01E.09.212	33.809444	-106.8383	
334830106502201	19660629	41.2	4241.6	4200.4	Rio Grande	255	06S.01E.09.212	33.809444	-106.8383	
334745106510001	19660613	10.8	4241.6	4230.8	Rio Grande	32	06S.01E.09.333	33.795833	-106.85	
334745106510001	19660712	10.8	4241.6	4230.8	Rio Grande	32	06S.01E.09.333	33.795833	-106.85	
334745106510001	19850205	15.04	4241.6	4226.6	Rio Grande	32	06S.01E.09.333	33.795833	-106.85	
334745106510001	19900125	11.65	4241.6	4230.0	Rio Grande	32	06S.01E.09.333	33.795833	-106.85	
334745106510001	19950214	9.66	4241.6	4231.9	Rio Grande	32	06S.01E.09.333	33.795833	-106.85	
334721106503201	19560610	26.5	4241.6	4215.1	Rio Grande		06S.01E.16.231	33.789167	-106.8422	
334717106520701	19580213	3.5	4241.6	4238.1	Rio Grande	10	06S.01E.17.133	33.788056	-106.8686	
334438106473001	19550208	256.42	4241.6	3985.2	Rio Grande	300	06S.01E.36.233	33.743889	-106.7917	2[b]
334438106473001	19850206	259.1	4241.6	3982.5	Rio Grande	300	06S.01E.36.233	33.743889	-106.7917	
334438106473001	19900125	260.69	4241.6	3980.9	Rio Grande	300	06S.01E.36.233	33.743889	-106.7917	
334818106533401			4241.6		Rio Grande	80	06S.01W.12.214	33.805	-106.8928	
334815106533801	19800702	32.02	4241.6	4209.6	Rio Grande	155	06S.01W.12.231	33.804167	-106.8939	500[b]
334823106532801	19580205	63	4241.6	4178.6	Rio Grande	75	06S.01W.12.233	33.806389	-106.8911	
334823106532801	19850205	30.97	4241.6	4210.6	Rio Grande	75	06S.01W.12.233	33.806389	-106.8911	
334823106532802	19950214	15.84	4241.6	4225.8	Rio Grande		06S.01W.12.233A	33.806389	-106.8911	
334800106532201			4241.6		Rio Grande		06S.01W.12.431	33.8	-106.8894	
334922106534701	19580206	116.9	4241.6	4124.7	Rio Grande	200	06S.01W.15.100	33.793333	-106.9386	
334439106532601	19560610	22.88	4241.6	4218.7	Rio Grande		06S.01W.36.412	33.744167	-106.8906	
334835106405201	19560417	317.7	4241.6	3923.9		600	06S.02E.01.444	33.809722	-106.6819	20[b]
334835106405201	19560418	317.73	4241.6	3923.9		600	06S.02E.01.444	33.809722	-106.6819	
334903106443001	19560907	420	4241.6	3821.6	Rio Grande		06S.02E.04.144	33.816667	-106.7422	3[b]
334834106445701			4241.6		Rio Grande		06S.02E.04.300	33.809444	-106.7492	
334818106433601	19560531	405	4241.6	3836.6	Rio Grande		06S.02E.10.141	33.805	-106.7267	11[b]
334818106433601	19560622	405	4241.6	3836.6	Rio Grande		06S.02E.10.141	33.805	-106.7267	
334510106412101	19550202	100.72	4241.6	4140.9		140	06S.02E.25.342	33.752778	-106.6892	
334517106442301	19850206	259.28	4241.6	3982.3	Rio Grande		06S.02E.28.413	33.754722	-106.7397	3[b]
334517106442301	19860113	258.95	4241.6	3982.7	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19880120	256.54	4241.6	3985.1	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19890313	256.69	4241.6	3984.9	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19890915	259.82	4241.6	3981.8	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19900126	258.76	4241.6	3982.8	Rio Grande		06S.02E.28.413	33.754722	-106.7397	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
334517106442301	19910207	264.38	4241.6	3977.2	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19920204	266.95	4241.6	3974.7	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19930204	258.85	4241.6	3982.8	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19950207	255.7	4241.6	3985.9	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19970128	255.15	4241.6	3986.5	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19980212	254.48	4241.6	3987.1	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	19990225	254.14	4241.6	3987.5	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334517106442301	20010315	253.69	4241.6	3987.9	Rio Grande		06S.02E.28.413	33.754722	-106.7397	
334908106390801	19610801	203.8	4241.6	4037.8		750	06S.03E.05.232 SRC-1	33.818889	-106.6522	200[b]
334908106390801	19890914	205.13	4241.6	4036.5		750	06S.03E.05.232 SRC-1	33.818889	-106.6522	
334908106390801	19900220	207.49	4241.6	4034.1		750	06S.03E.05.232 SRC-1	33.818889	-106.6522	
334908106390801	19950224	212.44	4241.6	4029.2		750	06S.03E.05.232 SRC-1	33.818889	-106.6522	
334908106390801	19950828	213.18	4241.6	4028.4		750	06S.03E.05.232 SRC-1	33.818889	-106.6522	
334908106390801	19960829	252.92	4241.6	3988.7		750	06S.03E.05.232 SRC-1	33.818889	-106.6522	
334908106391201			4241.6				06S.03E.05.233 SRC PROD	33.818889	-106.6533	
334908106391202			4241.6				06S.03E.05.233N SRC PROD	33.818889	-106.6533	
334908106391203			4241.6				06S.03E.05.233S SRC PROD	33.818611	-106.6533	
334007106391201	19690714	214.4	4241.6	4027.2		720	06S.03E.05.234	33.816667	-106.6533	141[b]
334007106391201	19890918	211.95	4241.6	4029.7		720	06S.03E.05.234	33.816667	-106.6533	
334007106391201	19900220	223.25	4241.6	4018.4		720	06S.03E.05.234	33.816667	-106.6533	
334007106391201	19950224	205.15	4241.6	4036.5		720	06S.03E.05.234	33.816667	-106.6533	
334007106391201	19960829	234.23	4241.6	4007.4		720	06S.03E.05.234	33.816667	-106.6533	
334817106361901	19550203	141.36	4241.6	4100.2			06S.03E.11.141	33.804722	-106.6053	
334700106355501			4241.6				06S.03E.14.400	33.783333	-106.5986	
334820106362801			4241.6				06S.03E.17.100	33.805556	-106.6078	
334729106390401			4241.6				06S.03E.17.200	33.791389	-106.6511	
334621106391101			4241.6				06S.03E.20.233	33.7725	-106.6531	
334645106362101			4241.6				06S.03E.22.122	33.779167	-106.6058	
334555106350901	19550203	116.41	4241.6	4125.2			06S.03E.25.122	33.765278	-106.5858	
334549106362101			4241.6				06S.03E.26.121	33.763611	-106.6058	
334845107081701	19850206	456	4241.6	3785.6	Rio Grande		06S.03W.10.111	33.8125	-107.1381	
334845107081701	19900129	455.58	4241.6	3786.0	Rio Grande		06S.03W.10.111	33.8125	-107.1381	
334646107112801			4241.6		Rio Grande		06S.03W.19.131 ANTELOPE	33.779444	-107.1911	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
334815106312501	19550223	110	4241.6	4131.6			06S.04E.10.131	33.804167	-106.5236	
334541107174601	19560118	199	4241.6	4042.6	Rio Grande		06S.04W.30.140	33.761389	-107.2961	
334509107123101	19560118	380	4241.6	3861.6	Rio Grande		06S.04W.36.113	33.7525	-107.2086	
334907106391201	19690714	214.4	4241.6	4027.2		720	06S.05E.05.234 SRC-2	33.818611	-106.6533	
334410106230501	19550507	300	4241.6	3941.6			06S.05E.36.343	33.736111	-106.3847	
334900107194001	19560118	234.75	4241.6	4006.9			06S.05W.02.233	33.816667	-107.3278	
334602107184601	19800806	325.93	4241.6	3915.7		400	06S.05W.24.342	33.767222	-107.3128	
334855106195201			4241.6				06S.06E.09.100	33.815278	-106.3311	
334824106200201	19550303	9.03	4241.6	4232.6			06S.06E.09.334	33.806667	-106.3339	
334750106193601			4241.6				06S.06E.16.411	33.797222	-106.3267	
334700106202501			4241.6				06S.06E.20.412 DEEP SP	33.783333	-106.3403	
334646106201801			4241.6				06S.06E.20.441 RABBIT SP	33.779444	-106.3383	
334645106162001			4241.6				06S.06E.24.400	33.779167	-106.2722	
334646106160601	19550308	301.67	4241.6	3939.9			06S.06E.24.424	33.779444	-106.2683	
334605106173301			4241.6				06S.06E.26.	33.768056	-106.2925	
334555106175301	19550308	39.5	4241.6	4202.1		203	06S.06E.26.333	33.7625	-106.3014	
334533106212501			4241.6				06S.06E.31.223 COUNCIL S	33.759167	-106.3569	
334533106212301			4241.6				06S.06E.31.223 SPR GALRY	33.759167	-106.3564	
334537106180501			4241.6				06S.06E.34.200	33.760278	-106.3014	
334528106182501			4241.6				06S.06E.34.200 BACATEST	33.757778	-106.3069	
334727107324601	19800121	13.42	4241.6	4228.2			06S.07W.15.23331	33.790833	-107.5461	
334453106062001	19560101	630	4241.6	3611.6			06S.08E.33.241	33.748056	-106.1056	
334759107410201			4241.6				06S.08W.08.432 WELTY SAL	33.799722	-107.6839	
334629107365601	19800121	236.86	4241.6	4004.7			06S.08W.24.411	33.774722	-107.6156	
334518107414201	19780413	20.02	4241.6	4221.6			06S.08W.31.222	33.755	-107.695	
334820106022801			4241.6				06S.09E.07.230	33.805556	-106.0411	
334605106022901			4241.6				06S.09E.19.400	33.768056	-106.0414	
334320106485701	19550209	201.24	4241.6	4040.4	Rio Grande		07S.01E.02.334	33.722222	-106.8158	
334140106484101	19550209	202.87	4241.6	4038.7	Rio Grande	215	07S.01E.14.341	33.694444	-106.8114	
334034106493001	19550209	226	4241.6	4015.6	Rio Grande		07S.01E.27.214	33.676111	-106.825	8[b]
334034106493001	19850206	257.26	4241.6	3984.3	Rio Grande		07S.01E.27.214	33.676111	-106.825	
334034106493001	19890313	246.8	4241.6	3994.8	Rio Grande		07S.01E.27.214	33.676111	-106.825	
334034106493001	19900125	246.72	4241.6	3994.9	Rio Grande		07S.01E.27.214	33.676111	-106.825	

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334034106493001	19950207	252	4241.6	3989.6	Rio Grande		07S.01E.27.214	33.676111	-106.825	
334034106493002			4241.6		Rio Grande		07S.01E.27.214B	33.676111	-106.825	
334209106590101	19800718	28.28	4241.6	4213.3	Rio Grande	140	07S.01W.18.140	33.7025	-106.9836	
334210106594201	19521002	18	4241.6	4223.6	Rio Grande	113	07S.01W.18.200	33.705278	-106.9764	
333917106570001	19850205	281.09	4241.6	3960.5	Rio Grande	299	07S.01W.33.423	33.654722	-106.95	
334214106444501			4241.6		Rio Grande		07S.02E.16.100	33.703889	-106.7458	
334011106422901	19550218	174	4241.6	4067.6			07S.02E.26.322	33.669722	-106.7081	
334243107020001	19850205	186.2	4241.6	4055.4	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19860114	188.36	4241.6	4053.2	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19870317	186.03	4241.6	4055.6	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19880120	168.08	4241.6	4073.5	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19890915	185.69	4241.6	4055.9	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19900129	187.51	4241.6	4054.1	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19910207	185.67	4241.6	4055.9	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19910717	185.42	4241.6	4056.2	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19920204	185.33	4241.6	4056.3	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19930204	185.15	4241.6	4056.5	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19950209	184.6	4241.6	4057.0	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19970128	184.44	4241.6	4057.2	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19980212	184.2	4250	4065.8	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	19990225	183.94	4235	4051.1	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
334243107020001	20010315	183.73	4235	4051.3	Rio Grande		07S.02W.10.341	33.711944	-107.0333	
333949107015601	19850205	82.17	4235	4152.8	Rio Grande	94	07S.02W.34.123	33.663611	-107.0322	
334350106381601	19560223	143.67	4235	4091.3			07S.03E.04.231	33.730556	-106.6378	
334059106373501	19550223	115.84	4235	4119.2			07S.03E.22.314	33.683056	-106.6264	
333900106285801	19560223	90.39	4235	4144.6			07S.03E.36.333	33.65	-106.5928	
334331107101101	19800111	242.94	4235	3992.1	Rio Grande		07S.03W.08.121	33.725278	-107.1697	2.5[b]
334329107071201	19810403	120	4250	4130.0	Rio Grande	360	07S.03W.11.112A	33.724722	-107.12	15[b]
334323107071001	19830301	243	4235	3992.0	Rio Grande	432	07S.03W.11.112B	33.723056	-107.1194	30[b]
334103106302001	19550520	11.87	4235	4223.1			07S.04E.23.312	33.684167	-106.5056	
333959106322101	19550523	44.96	4235	4190.0			07S.04E.28.334	33.666389	-106.5392	
333955106315301			4235				07S.04E.33.400	33.665278	-106.5314	
334412107125601	19810325	435	4235	3800.0	Rio Grande	496	07S.04W.02.200	33.736667	-107.2156	30[b]

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334010107140101	19800807	171.92	4235	4063.1	Rio Grande	300	07S.04W.27.432	33.669444	-107.2336	10[b]
334010107140101	19850205	141.75	4235	4093.3	Rio Grande	300	07S.04W.27.432	33.669444	-107.2336	
334036107152401	19800807	50.14	4275	4224.9	Rio Grande		07S.04W.28.142	33.676667	-107.2567	
334408107225301	19800806	124.81	4230	4105.2			07S.05W.05.122	33.735556	-107.3814	
334046106203501			4260				07S.06E.29.414	33.679444	-106.3431	
334337106125501	19550519	68.48	4260	4191.5			07S.07E.09.222	33.726944	-106.2153	
334210106120001			4250				07S.07E.15.440	33.702778	-106.2	
334104106115801			4245				07S.07E.15.442	33.684444	-106.1994	
334226106151501			4246				07S.07E.18.400	33.707222	-106.2542	
334149107325001	19760806	18	4246	4228.0		101	07S.07W.15.300	33.696944	-107.5472	
334250106075401	19561121	242.8	4246	4003.2		710	07S.08E.08.322+DUP	33.713889	-106.1317	
334241106073601			4246				07S.08E.08.412	33.711389	-106.1267	
334156106045401			4246				07S.08E.14.323 RENFRO	33.698889	-106.0817	
334130106051801			4235				07S.08E.22.223	33.691667	-106.0883	
334014106075001			4350				07S.08E.29.144	33.670556	-106.1306	
333925106054801			4380				07S.08E.34.322	33.656944	-106.0967	
334351107382801	19800121	546.74	4380	3833.3			07S.08W.02.311	33.730833	-107.6411	
334335107401001	19781117	511.2	4380	3868.8			07S.08W.04.342A	33.726389	-107.6694	
334335107401001	19790214	510.25	4380	3869.8			07S.08W.04.342A	33.726389	-107.6694	
334335107401001	19800122	511.57	4380	3868.4			07S.08W.04.342A	33.726389	-107.6694	
334335107401001	19800123	511.57	4380	3868.4			07S.08W.04.342A	33.726389	-107.6694	
334335107401001	19810318	511.35	4380	3868.7			07S.08W.04.342A	33.726389	-107.6694	
334335107401002	19780413	49.5	4380	4330.5			07S.08W.04.344B	33.726389	-107.6694	
334335107401002	19780417	4.95	4380	4375.1			07S.08W.04.344B	33.726389	-107.6694	
334335107401002	19790214	7.43	4380	4372.6			07S.08W.04.344B	33.726389	-107.6694	
334335107401002	19800123	75.37	4380	4304.6			07S.08W.04.344B	33.726389	-107.6694	
334335107401002	19810318	81.82	4380	4298.2			07S.08W.04.344B	33.726389	-107.6694	
334109107402701	19780501	231.1	4380	4148.9			07S.08W.21.314	33.685833	-107.6742	
334109107402701	19900131	228.78	4380	4151.2			07S.08W.21.314	33.685833	-107.6742	
334109107402701	19910213	228.81	4380	4151.2			07S.08W.21.314	33.685833	-107.6742	
334109107402701	19920220	232.86	4380	4147.1			07S.08W.21.314	33.685833	-107.6742	
334109107402701	19930223	229.78	4380	4150.2			07S.08W.21.314	33.685833	-107.6742	
334109107402701	19940224	228.25	4380	4151.8			07S.08W.21.314	33.685833	-107.6742	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
334109107402701	19950221	248.38	4380	4131.6			07S.08W.21.314	33.685833	-107.6742	
334109107402701	19960205	228.93	4380	4151.1			07S.08W.21.314	33.685833	-107.6742	
334038107402201			4380				07S.08W.28.141 HENDERSON	33.677222	-107.6728	
333409106270501			4380			465	80532344	33.569167	-106.4514	
333634106502101	19550209	189.76	4380	4190.2	Rio Grande		08S.01E.16.441	33.609444	-106.8392	
333500106471201			4380				08S.01E.25.420	33.583333	-106.7867	
333458106471201	19550209	163	4380	4217.0		300	08S.01E.25.421	33.582778	-106.7867	
333608106541901	19560814	231.26	4282	4050.7	Rio Grande		08S.01W.23.224	33.602222	-106.9053	
333354106565801	19560814	275.9	4285	4009.1		340	08S.01W.33.341	33.565	-106.9494	5[b]
333705106450201			4285				08S.02E.17.200	33.618056	-106.7506	
333711106450901	19560713	169.36	4257	4087.6		183	08S.02E.17.224	33.619722	-106.7525	2.5[b]
333549106425801	19550218	150.95	4257	4106.1			08S.02E.23.313	33.596944	-106.7161	
333435106405301			4260				08S.02E.25.400	33.576389	-106.6814	
333810107005001	19950419	62.85	4260	4197.2	Rio Grande	138	08S.02W.11.121	33.636111	-107.0139	
333719106380501	19560704	104.8	4260	4155.2			08S.03E.09.434	33.621944	-106.6347	
333827107072101	19560113	225.7	4260	4034.3	Rio Grande	277	08S.03W.02.331	33.640833	-107.1225	
333457107110401	19800723	259.66	4260	4000.3	Rio Grande	271	08S.03W.30.342	33.5825	-107.1844	4[b]
333357107052601	19850205	41.68	4260	4218.3	Rio Grande	65	08S.03W.36.444	33.565833	-107.0906	
333357107052601	19900129	31.54	4260	4228.5	Rio Grande	65	08S.03W.36.444	33.565833	-107.0906	
333357107052601	19950209	39.34	4257	4217.7	Rio Grande	65	08S.03W.36.444	33.565833	-107.0906	
333715106312001			4251				08S.04E.10.300	33.620833	-106.5222	
333722106282101			4246				08S.04E.12.444 DIRECT CO	33.622778	-106.4725	
333610106321201	19550523	45.75	4246	4200.3			08S.04E.21.123	33.602778	-106.5367	
333745107152301	19800807	85.04	4246	4161.0	Rio Grande		08S.04W.09.321	33.629167	-107.2564	6[b]
333405107165901	19800723	119.16	4246	4126.8	Rio Grande	200	08S.04W.31.441	33.568056	-107.2831	
333421107153001	19800723	355.9	4246	3890.1	Rio Grande	403	08S.04W.33.321	33.5725	-107.2583	18[b]
333437107133601	19800723	410.11	4246	3835.9	Rio Grande		08S.04W.35.113	33.576944	-107.2267	
333900106273201	19550509	342.49	4251	3908.5			08S.05E.05.311	33.65	-106.4589	
333409106272001	19650702	180.8	4251	4070.2		250	08S.05E.32.334	33.568889	-106.455	
333409106272001	19890313	176.42	4251	4074.6		250	08S.05E.32.334	33.568889	-106.455	
333409106272001	19890914	176.55	4246	4069.5		250	08S.05E.32.334	33.568889	-106.455	
333409106272001	19900220	176.32	4246	4069.7		250	08S.05E.32.334	33.568889	-106.455	
333409106272001	19900914	176.28	4246	4069.7		250	08S.05E.32.334	33.568889	-106.455	

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333409106272001	19950224	174.97	4246	4071.0		250	08S.05E.32.334	33.568889	-106.455	
333409106272001	19950831	174.93	4246	4071.1		250	08S.05E.32.334	33.568889	-106.455	
333409106272001	19960828	175.08	4246	4070.9		250	08S.05E.32.334	33.568889	-106.455	
333415106270001	19550520	192.28	4266	4073.7			08S.05E.32.431	33.570833	-106.45	
333412106265601	19660428	201.63	4230	4028.4		290	08S.05E.32.431 MURRAY-SW	33.57	-106.4489	
333407107211501	19610713	110	4267	4157.0			08S.05W.33.400	33.568611	-107.3542	
334248106075501			4267				08S.07E.08.322A	33.713333	-106.1319	
333709107334301	19780101	758.2	4267	3508.8			08S.07W.16.23214	33.619167	-107.5619	
333506107362401	19780412	82.05	4267	4185.0			08S.07W.30.313	33.585	-107.6067	
333421107360301			4267				08S.07W.31.144 SPRING	33.5725	-107.6008	
333438107353601	19780512	89.77	4260	4170.2			08S.07W.31.223	33.577222	-107.5933	
333422107360501			4260				08S.07W.31.233 SPRING	33.572778	-107.6014	
323155107353501			4235				08S.07W.31.241 SPRING-OJ	33.531944	-107.5931	
333425107353501			4235				08S.07W.31.244 OJO CALIE	33.573611	-107.5931	
333426107353501			4245				08S.07W.31.300 OJO CALIE	33.573889	-107.5931	
334248106075502			4265				08S.08E.08.322B	33.713333	-106.1319	
333845107364101	19781115	333.55	4245	3911.5			08S.08W.01.243	33.645833	-107.6114	
333813107400201	19780412	44.99	4246	4201.0			08S.08W.09.211	33.636944	-107.6672	
333740107392301	19780412	34.4	4246	4211.6		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	19790214	36.16	4265	4228.8		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	19810318	37.98	4265	4227.0		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	19900131	32.32	4266	4233.7		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	19910213	34.34	4266	4231.7		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	19920220	35.44	4266	4230.6		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	19930223	24.09	4265	4240.9		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	19960206	35.69	4265	4229.3		124	08S.08W.10.314	33.627778	-107.6564	
333740107392301	20010206	34.52	4265	4230.5		124	08S.08W.10.314	33.627778	-107.6564	
333733107391801	19780412	28.04	4265	4237.0			08S.08W.10.341	33.625833	-107.655	
333733107391801	19790328	30.53	4265	4234.5			08S.08W.10.341	33.625833	-107.655	
333733107391802	19790328	31.65	4245	4213.4			08S.08W.10.341A	33.625833	-107.655	
333643107363201			4246				08S.08W.13.442	33.611944	-107.6089	
333700107383701	19780412	43.98	4246	4202.0		50	08S.08W.15.244	33.616667	-107.6436	
333702107420301	19780504	404.04	4235	3831.0			08S.08W.18.23414	33.617222	-107.7008	

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333616107390901	19780503	22.65	4235	4212.4			08S.08W.22.142	33.604444	-107.6525	
333616107390901	19910213	23.62	4235	4211.4			08S.08W.22.142	33.604444	-107.6525	
333525107374901	19780510	18.68	4235	4216.3			08S.08W.26.232	33.590278	-107.6303	
333416107414601	19780502	345.26	4235	3889.7			08S.08W.31.424	33.571111	-107.6961	
333356107404901	19780502	356.83	4235	3878.2			08S.08W.32.443	33.565556	-107.6803	
333446107373301			4238				08S.08W.35.222	33.579444	-107.6258	
333124106524901	19560814	326.13	4233	3906.9		368	09S.01E.18.324	33.523333	-106.8803	
333124106524901	19850206	325.88	4233	3907.1		368	09S.01E.18.324	33.523333	-106.8803	
333124106524901	19900126	322.15	4240	3917.9		368	09S.01E.18.324	33.523333	-106.8803	
333124106524901	19950322	318.15	4230	3911.9		368	09S.01E.18.324	33.523333	-106.8803	
333125106525001	19560814	326.13	4226	3899.9		355	09S.01E.18.341	33.523611	-106.8806	
332912106482201			4240				09S.01E.35.200	33.486667	-106.8061	
333040106551401	19560814	272.41	4246	3973.6		300	09S.01W.23.311	33.511111	-106.9206	
333038106551001							09S.01W.23.311+DUP	33.510556	-106.9194	
333207106450601	19580906	60				125	09S.02E.08.440	33.535278	-106.7517	
333026106464401							09S.02E.19.300	33.507222	-106.7789	
333053106451201							09S.02E.20.200	33.514722	-106.7533	
332946106414501	19570211	36.84					09S.02E.25.311	33.496111	-106.6958	
332919106432101	19560713	48.86					09S.02E.34.211	33.488611	-106.7225	
332941106381701	19550629	39.31					09S.03E.28.324	33.494722	-106.6381	
333325107065601	19830115	120	4240	4120.0	Rio Grande	122	09S.03W.02.322	33.556944	-107.1156	20[b]
333325107065601	19850205	108.7	4240	4131.3	Rio Grande	122	09S.03W.02.322	33.556944	-107.1156	
333325107065601	19860114	99.97	4232	4132.0	Rio Grande	122	09S.03W.02.322	33.556944	-107.1156	
333105107094801	19800723	259.65	4232	3972.4	Rio Grande		09S.03W.20.232	33.518056	-107.1633	18[b]
333321106320501			4242				09S.04E.04.	33.555833	-106.5347	
333111106341001	19550602	18.38	4242	4223.6			09S.04E.18.344	33.519722	-106.5694	
333325107134201			4235		Rio Grande		09S.04W.03.421 NOGAL CAN	33.556944	-107.2283	
333345106264001			4235				09S.05E.05.241	33.5625	-106.4444	
333155106250501			4235				09S.05E.15.143	33.531944	-106.4181	
332901106252501	19560411	138.55	4235	4096.5		175	09S.05E.34.313	33.483611	-106.4236	
332915107244901	19800809	10.83	4235	4224.2			09S.06W.36.141	33.4875	-107.4136	
333235107360601	19780511	20.67	4235	4214.3			09S.07W.07.144	33.543056	-107.6017	
333254107351101	19780511	44	4235	4191.0			09S.07W.08.121	33.548333	-107.5864	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
333136107361601	19790406	62.7	4235	4172.3			09S.07W.18.312	33.526667	-107.6044	
333322107353501			4235				09S.07W.6.423 ALUM SPRIN	33.556111	-107.5931	
333313107373101	19780510	48.7	4235	4186.3			09S.08W.01.33131	33.553611	-107.6253	
333313107373101	19910213	54.14	4235	4180.9			09S.08W.01.33131	33.553611	-107.6253	
333344107390801			4235				09S.08W.03.142 SAM COX W	33.562222	-107.6519	
333354107384901			4235				09S.08W.03.213 FALCO WEL	33.565	-107.6469	
333257107404601	19780510	247.36	4235	3987.6			09S.08W.08.223	33.549167	-107.6794	
333157107371201	19780511	243.22	4235	3991.8			09S.08W.13.123	33.5325	-107.62	
333146107384001	19780511	182.95	4235	4052.1			09S.08W.15.244	33.529444	-107.6444	
333146107384001	19790406	182.98	4235	4052.0			09S.08W.15.244	33.529444	-107.6444	
333150107402401	19780510	100.93	4235	4134.1			09S.08W.16.243	33.530556	-107.6733	
333116107415301	19780510	234.56	4235	4000.4			09S.08W.19.221	33.521111	-107.6981	
333108107364201	19790406	5.38	4235	4229.6			09S.08W.24.221	33.518889	-107.6117	
333005107374301	19790406	245	4235	3990.0			09S.08W.26.241	33.501389	-107.6286	
333019107402201	19790329	132.62	4235	4102.4			09S.08W.28.121	33.505278	-107.6728	
333019107402201	19910213	136.27	4235	4098.7			09S.08W.28.121	33.505278	-107.6728	
332933107423701	19790329	307.04	4235	3928.0			09S.08W.30.333	33.4925	-107.7103	
332848107375801	19790406	124.6	4235	4110.4			09S.08W.35.431	33.48	-107.6328	
342516106430001	19960312	280	4235	3955.0	Rio Grande	360	12N.02E.03.43	34.421111	-106.7167	
340842106560201	19920621	240	4235	3995.0	Rio Grande	300	2S.1W.10.343	34.145	-106.9339	
334712106285801	19920516	212	4235	4023.0		300	6S.4E.13.322	33.786667	-106.4828	
341242106452301			4235		Rio Grande		SEVILLETA GRANT(34124210	34.211667	-106.7564	
341412107003301			4235		Rio Grande		SEVILLETA GRANT(34141210	34.236667	-107.0092	
341420107013001			4235		La Jencia		SEVILLETA GRANT(34142010	34.238889	-107.025	
341427107001501			4235		Rio Grande		SEVILLETA GRANT(34142710	34.240833	-107.0042	
342231106372401			4235		Rio Grande		SEVILLETA GRANT(34223110	34.375278	-106.6233	
340252106561601			4235		Rio Grande		TOWN OF SOCORRO COOK SP	34.047778	-106.9378	
340225106561801			4235		Rio Grande		TOWN OF SOCORRO GRANT	34.040278	-106.9383	
340218106562001			4235		Rio Grande		TOWN OF SOCORRO SEDILLO	34.038333	-106.9389	
330710107174801			4235			377	3140406313	33.119444	-107.2967	
330715107172301			4235			410	03140406411A	33.120833	-107.2897	
332915107244901	19800809	10.83	4230	4219.2			09S.06W.36.141	33.4875	-107.4136	
332848107375801	19790406	124.6	4375	4250.4			09S.08W.35.431	33.48	-107.6328	

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332845107453201	19560120	9.22	4360	4350.8		16	09S.09W.34.343	33.479167	-107.7583	
332924107441301	19790405	21.7	4300	4278.3			09S.09W.35.211	33.49	-107.7369	
332530107010001			4282			6040	10S.02W.25.100 SUN OIL T	33.425	-107.0167	
332808107095601	19661201	90	4531	4441.0	Rio Grande	174	10S.03W.05.410	33.468889	-107.1656	
332605107093301			4528		Rio Grande	9.1	10S.03W.16.333	33.434722	-107.1592	
332643107104601			4528		Rio Grande		10S.03W.18.223	33.445833	-107.1792	
332649107104601	19840302	202.53	4528	4325.5	Rio Grande	213	10S.03W.18.241	33.447222	-107.1806	
332649107104601	19890216	174.22	4558	4383.8	Rio Grande	213	10S.03W.18.241	33.447222	-107.1806	
332649107104601	19940215	173.69			Rio Grande	213	10S.03W.18.241	33.447222	-107.1806	
332517107101901					Rio Grande		10S.03W.20.114	33.421389	-107.1719	
332550107102001	19710923	2.25			Rio Grande	10.5	10S.03W.20.141	33.430556	-107.1722	
332550107102001	19710929	2.25			Rio Grande	10.5	10S.03W.20.141	33.430556	-107.1722	
332550107102001	19711014	2.26			Rio Grande	10.5	10S.03W.20.141	33.430556	-107.1722	
332603107100201	19710924	4.14			Rio Grande	12.3	10S.03W.20.211	33.434167	-107.1672	
332603107100201	19710929	4.21			Rio Grande	12.3	10S.03W.20.211	33.434167	-107.1672	
332603107100201	19711014	4.24			Rio Grande	12.3	10S.03W.20.211	33.434167	-107.1672	
332533107102701	19710923	9.41			Rio Grande	10.9	10S.03W.20.312	33.425833	-107.1742	
332533107102701	19710929	9.51			Rio Grande	10.9	10S.03W.20.312	33.425833	-107.1742	
332533107102701	19711014	9.49			Rio Grande	10.9	10S.03W.20.312	33.425833	-107.1742	
332533107102702	19710923	12.12			Rio Grande	18.6	10S.03W.20.312A	33.425833	-107.1742	
332533107102702	19710929	11.99			Rio Grande	18.6	10S.03W.20.312A	33.425833	-107.1742	
332533107102702	19711014	11.96			Rio Grande	18.6	10S.03W.20.312A	33.425833	-107.1742	
332518107102501	19710923	8.91			Rio Grande	12.8	10S.03W.20.332	33.421667	-107.1736	
332518107102501	19710929	9			Rio Grande	12.8	10S.03W.20.332	33.421667	-107.1736	
332518107102501	19711014	9.12			Rio Grande	12.8	10S.03W.20.332	33.421667	-107.1736	
332417107110901	19771201	84			Rio Grande	192	10S.03W.31.122	33.404722	-107.1858	
332637107165801					Rio Grande	175	10S.04W.18.240	33.443611	-107.2828	
332503107141201	19840302	380.43			Rio Grande		10S.04W.27.142	33.416667	-107.2361	
332503107141201	19940215	338			Rio Grande		10S.04W.27.142	33.416667	-107.2361	
332336107114601	19800809	237.78			Rio Grande		10S.04W.36.442	33.393333	-107.1961	
332328107114001	19571201	220			Rio Grande	400	10S.04W.36.444	33.391111	-107.1944	
332553107211101	19800807	88.96			Rio Grande		10S.05W.21.223	33.431389	-107.3531	
332548107211201	19800807	31.12			Rio Grande		10S.05W.21.241	33.43	-107.3533	

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332532107204601	19560121	32.05			Rio Grande	37	10S.05W.22.312	33.425556	-107.3461	
332514107202601	19800807	27.44			Rio Grande	34	10S.05W.22.334	33.420556	-107.3406	
332725107302101	19790201	48				150	10S.06W.07.131	33.456944	-107.5058	
332725107302102	19790201	33				151	10S.06W.07.131A	33.456944	-107.5058	
332719107300701	19761014	54.5				150	10S.06W.07.134	33.455278	-107.5019	
332719107300702	19790601	93				125	10S.06W.07.134A	33.455278	-107.5019	
332600107292001					Rio Grande	85	10S.06W.18.444	33.433333	-107.4889	
332556107292101	19580109	35.98			Rio Grande	130	10S.06W.19.222	33.432222	-107.4892	
332553107291101	19750401	48			Rio Grande	149	10S.06W.20.110	33.431389	-107.4864	
332425107280701	19740301	53			Rio Grande	125	10S.06W.28.330	33.406944	-107.4686	
332432107281601	19781129	61			Rio Grande	98	10S.06W.29.400	33.408889	-107.4711	
332441107281701	19580109	65.91			Rio Grande	125	10S.06W.29.422	33.411389	-107.4714	
332916107272801					Rio Grande		10S.06W.33.221	33.404444	-107.4578	
332352107274901	19560121	56.55			Rio Grande		10S.06W.33.322	33.397778	-107.4636	
332347107270801	19770215	70			Rio Grande	106	10S.06W.34.310	33.396389	-107.4522	
332347107270802					Rio Grande	126	10S.06W.34.310A	33.396389	-107.4522	
332347107270803	19580109	106.87			Rio Grande	158	10S.06W.34.310B	33.396389	-107.4522	
332349107270301	19800716	76.87			Rio Grande		10S.06W.34.312	33.396944	-107.4508	
332349107265601					Rio Grande	85	10S.06W.34.321	33.396944	-107.4489	
332343107265601					Rio Grande	123	10S.06W.34.323	33.395278	-107.4489	
332343107265602					Rio Grande	120	10S.06W.34.323A	33.395278	-107.4489	
332342107264501					Rio Grande	125	10S.06W.34.324	33.395	-107.4458	
332342107264502					Rio Grande	130	10S.06W.34.324A	33.395	-107.4458	
332347107265301	19840229	49.58			Rio Grande	55	10S.06W.34.341	33.397222	-107.4472	
332347107265301	19890215	48.93			Rio Grande	55	10S.06W.34.341	33.397222	-107.4472	
332347107265301	19940215	45.38			Rio Grande	55	10S.06W.34.341	33.397222	-107.4472	
332727107402801	19790404	357.12				500	10S.08W.09.132	33.4575	-107.6744	
332727107410301							10S.08W.09.132 BLM GARRE	33.456944	-107.6847	
332646107370901	19790406	11.57			Rio Grande		10S.08W.13.123	33.446111	-107.6192	
332643107403601	19411023	189.5					10S.08W.17.220	33.445278	-107.6767	
332612107420301	19790404	48.1			Rio Grande		10S.08W.18.432	33.436667	-107.7008	
332546107413501	19790404	58.58			Rio Grande		10S.08W.20.113	33.429444	-107.6931	
332523107413501	19790404	78.43			Rio Grande		10S.08W.20.313	33.423056	-107.6931	

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332549107393801	19790406	337.46			Rio Grande		10S.08W.21.224	33.430278	-107.6606	
332430107410901	19411023	53.3			Rio Grande		10S.08W.29.000	33.408333	-107.6858	
332723107412601	19790405	16.44				125	10S.09W.12.143	33.456389	-107.7242	
332723107434501							10S.09W.12.143 SAGE IRRI	33.456944	-107.7292	
332133107103801					Rio Grande	128	11S.03W.17.110	33.359167	-107.1772	
332132107112001	19800807	125.78			Rio Grande		11S.03W.18.123	33.358889	-107.1889	
332108107171301	19620214	100			Rio Grande	173	11S.04W.18.410	33.352222	-107.2869	
331846107173101	19840229	16.82			Rio Grande		11S.04W.31.312	33.313889	-107.2917	
331846107173101	19890215	12.58			Rio Grande		11S.04W.31.312	33.313889	-107.2917	
331846107173101	19940215	15.33			Rio Grande		11S.04W.31.312	33.313889	-107.2917	
331825107170701	19571118	55.1			Rio Grande		11S.04W.31.440	33.306944	-107.2853	
331825107170702					Rio Grande		11S.04W.31.440A	33.306944	-107.2853	
331825107170703	19571118	20			Rio Grande		11S.04W.31.440B	33.306944	-107.2853	
331819107164301	19571118	22.1			Rio Grande		11S.04W.32.330	33.305278	-107.2786	
331832107161701	19800718	32.99			Rio Grande	70	11S.04W.32.413	33.308889	-107.2714	
331833107155901	19840301	27.22			Rio Grande	34	11S.04W.32.432	33.308333	-107.2667	
331833107155901	19890215	23.72			Rio Grande	34	11S.04W.32.432	33.308333	-107.2667	
331833107155901	19940215	25.6			Rio Grande	34	11S.04W.32.432	33.308333	-107.2667	
332013107234701					Rio Grande		11S.05W.19.323	33.3375	-107.3958	
331910107195001					Rio Grande	251	11S.05W.26.330	33.319444	-107.3306	
331914107200201	19840301	34.28			Rio Grande		11S.05W.26.333	33.319444	-107.3333	
331914107200201	19890215	33.82			Rio Grande		11S.05W.26.333	33.319444	-107.3333	
331914107200201	19940215	33.05			Rio Grande		11S.05W.26.333	33.319444	-107.3333	
331910107193501	19751108	24			Rio Grande	225	11S.05W.26.340	33.319444	-107.3278	
331926107193101	19840229	1.78			Rio Grande		11S.05W.26.431	33.325	-107.325	
331926107193101	19890215				Rio Grande		11S.05W.26.431	33.325	-107.325	
331926107193101	19940215				Rio Grande		11S.05W.26.431	33.325	-107.325	
331933107215901					Rio Grande		11S.05W.28.133	33.325833	-107.3664	
331900107194601	19840301	36.99			Rio Grande		11S.05W.35.141	33.316667	-107.3306	
331900107194601	19890215	36.66			Rio Grande		11S.05W.35.141	33.316667	-107.3306	
331900107194601	19940215	36.44			Rio Grande		11S.05W.35.141	33.316667	-107.3306	
331902107182701	19810210	45.39			Rio Grande	50	11S.05W.36.1222	33.317222	-107.3075	
332238107254501					Rio Grande		11S.06W.02.344	33.377222	-107.4292	

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332232107254501					Rio Grande	80	11S.06W.11.122	33.375556	-107.4292	
332224107254601					Rio Grande	125	11S.06W.11.124	33.373333	-107.4294	
332158107251901					Rio Grande		11S.06W.11.423	33.366111	-107.4219	
332153107251401	19810211	86.49			Rio Grande		11S.06W.11.442	33.364722	-107.4206	
332146107250701					Rio Grande	85	11S.06W.12.333	33.362778	-107.4186	
331950107282601	19790803	300			Rio Grande	372	11S.06W.29.220	33.330556	-107.4739	
331834107282301	19790101	262			Rio Grande	500	11S.06W.32.422	33.309444	-107.4731	
332057107343601	19771030	167			Rio Grande	195	11S.07W.17.440	33.349167	-107.5767	
331654107110201	19810210	49.42			Rio Grande		12S.03W.07.23344	33.281667	-107.1839	
331435107113401	19810210	87.5			Rio Grande		12S.03W.30.112	33.243056	-107.1928	
331805107135401	19631001	112			Rio Grande	245	12S.04W.03.220	33.301389	-107.2317	
331808107135601	19810213	103.55			Rio Grande		12S.04W.03.2213	33.302222	-107.2322	
331431107132901	19920512	195			Rio Grande	235	12S.04W.27.1	33.241944	-107.2247	
331412107160001	19800811	479.88			Rio Grande	600	12S.04W.29.421	33.236667	-107.2667	
331355107155901	19610927	428.91			Rio Grande	600	12S.04W.29.440	33.231944	-107.2664	
331355107155901	19630621	429.83			Rio Grande	600	12S.04W.29.440	33.231944	-107.2664	
331316107164401	19660101	380			Rio Grande	422	12S.04W.32.310	33.221111	-107.2789	
331324107121401	19810209	89.08			Rio Grande	254	12S.04W.36.1344	33.223333	-107.2094	
331740107194001	19810211	356.32			Rio Grande		12S.05W.02.321	33.294444	-107.3278	
331736107240701	19800101	300			Rio Grande	500	12S.05W.06.313	33.293333	-107.4019	
331403107201401					Rio Grande		12S.05W.27.300	33.234167	-107.3372	
331356107203701	19760801	32			Rio Grande	125	12S.05W.27.340	33.232222	-107.3436	
331423107223601					Rio Grande	49.7	12S.05W.28.142	33.239722	-107.3767	
331410107220001					Rio Grande	51	12S.05W.28.311	33.236111	-107.3667	
331412107213501	19810211	48.5			Rio Grande		12S.05W.28.3222	33.236667	-107.3597	
331424107224701	19810211	54			Rio Grande		12S.05W.29.1411	33.24	-107.3797	
331419107225701	19730601	54			Rio Grande	150	12S.05W.29.1412	33.239722	-107.3789	
331419107225701	19810211	54.24			Rio Grande	150	12S.05W.29.1412	33.239722	-107.3789	
331418107220801	19730127	32			Rio Grande	150	12S.05W.29.240	33.238333	-107.3689	
331342107184701	19731219	19			Rio Grande	100	12S.05W.36.110	33.228333	-107.3131	
331632107334301					Rio Grande	28	12S.07W.09.430	33.275556	-107.5619	
331627107353701	19560120	19.41			Rio Grande		12S.07W.18.210	33.274167	-107.5936	
330823107061901	19840223	147.73					13S.03W.36.123	33.138889	-107.1056	

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330743107062101	19830223	147.4					13S.03W.36.343	33.128611	-107.1058	
330743107062101	19850211	147.35					13S.03W.36.343	33.128611	-107.1058	
331025107142701	19691119	121			Rio Grande	199	13S.04S.15.340	33.173611	-107.2408	
331235107124501	19840301	41.48			Rio Grande		13S.04W.01.133	33.211111	-107.2139	
331235107124501	19890215	14.9			Rio Grande		13S.04W.01.133	33.211111	-107.2139	
331235107124501	19940215	16.59			Rio Grande		13S.04W.01.133	33.211111	-107.2139	
331229107122901					Rio Grande		13S.04W.01.300	33.208333	-107.2083	
331229107122601	19810210	48.55			Rio Grande		13S.04W.01.321	33.208056	-107.2072	
331254107132801	19600406	208			Rio Grande	326	13S.04W.02.320	33.213889	-107.225	
331216107131701	19630621	165			Rio Grande	401	13S.04W.02.431	33.204444	-107.2214	
331216107131701	19810210	120.44			Rio Grande	401	13S.04W.02.431	33.204444	-107.2214	
330740107151801					Rio Grande		13S.04W.04.211	33.127778	-107.255	
331210107151201					Rio Grande		13S.04W.04.433	33.202778	-107.2533	
330737107174801	19470122	98			Rio Grande	334	13S.04W.06.110	33.126944	-107.2967	
331116107162001	19720225	82.03			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19730126	72.6			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19740122	79.52			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19750210	85.29			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19760210	82.48			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19770228	79.49			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19790214	81.75			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19800220	80.35			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19810309	84.89			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331116107162001	19840301	82.6			Rio Grande		13S.04W.08.433	33.188889	-107.2722	
331203107135401	19690517	215			Rio Grande	265	13S.04W.10.222	33.200833	-107.2317	
331118107131201	19600314	215			Rio Grande	353	13S.04W.11.430	33.188333	-107.22	
331048107122701	19630701	61			Rio Grande	498	13S.04W.13.143	33.18	-107.2075	
331106107143301					Rio Grande	227	13S.04W.15.100	33.185	-107.2425	
331007107144201	19780801	165			Rio Grande	216	13S.04W.15.100+DUP	33.168611	-107.245	
331052107143601	19730808	153			Rio Grande	217	13S.04W.15.100+DUP2	33.181111	-107.2433	
331058107143601	19730731	203			Rio Grande	258	13S.04W.15.100+DUP3	33.182778	-107.2433	
331052107141101	19740223	110			Rio Grande	180	13S.04W.15.230	33.181111	-107.2364	
331025107142702	19660416	135			Rio Grande	200	13S.04W.15.340	33.173611	-107.2408	

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331105107152701	19700701	97			Rio Grande	138	13S.04W.16.120	33.184722	-107.2575	
331105107162801	19760201	86			Rio Grande	200	13S.04W.17.120	33.184722	-107.2744	
331034107161201	19760927	33			Rio Grande	243	13S.04W.17.414	33.176111	-107.27	
331036107162001	19840301	85.11			Rio Grande	118	13S.04W.17.431	33.177778	-107.2722	
331036107162001	19940215	78.82			Rio Grande	118	13S.04W.17.431	33.177778	-107.2722	
331036107162001	19990120	80.9			Rio Grande	118	13S.04W.17.431	33.177778	-107.2722	
331013107152601	19711015	75			Rio Grande	294	13S.04W.21.120	33.170278	-107.2572	
331007107151101	19780301	71			Rio Grande	105	13S.04W.21.200	33.168611	-107.2531	
331016107151601	19731114	70			Rio Grande	100	13S.04W.21.211	33.171111	-107.2544	
331002107150001	19720225	65.56			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19740122	62.26			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19750210	62.61			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19760210	61.35			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19770228	61.47			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19780216	62.3			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19790214	63.7			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19800220	63.53			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19810309	64			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19810929	63.29			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19820330	63.34			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19830217	62.44			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19830816	62.29			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19840301	61.06			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19840727	61.21			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19850816	58.17			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19860228	57.36			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19860904	54.72			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19870831	53.2			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19880121	53.16			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19890215	51.8			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19900914	50.37			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19910319	50.28			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19920227	49.73			Rio Grande		13S.04W.21.213	33.166667	-107.25	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
331002107150001	19920727	48.84			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19930205	49.31			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19930716	49.98			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19940215	50.06			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19940728	49.52			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19950210	49.43			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19950703	49.59			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19960209	49.16			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19960830	45.06			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19970228	46.54			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19970724	47.28			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19980311	47.1			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19980728	47.94			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19990120	47.68			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	19990726	47.8			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	20000204	47.16			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	20000725	48.21			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	20010215	48.44			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331002107150001	20010726	49.49			Rio Grande		13S.04W.21.213	33.166667	-107.25	
331003107150601	19720119	70			Rio Grande	106	13S.04W.21.232	33.1675	-107.2517	
330957107151601	19740404	91			Rio Grande	135	13S.04W.21.233	33.165833	-107.2544	
330957107150801	19580901	75			Rio Grande		13S.04W.21.234	33.165833	-107.2522	
331000107145601	19770718	63			Rio Grande	99.4	13S.04W.21.240	33.166667	-107.2489	
330948107145501	19751001	55			Rio Grande	119	13S.04W.21.420	33.163333	-107.2486	
330946107145301	19721231	52			Rio Grande	100	13S.04W.21.424	33.162778	-107.2481	
330951107142001	19690128	60			Rio Grande	95	13S.04W.22.000	33.164167	-107.2389	
331007107143501	19600601	80			Rio Grande	130	13S.04W.22.100	33.168611	-107.2431	
330942107143801	19560121	47.16			Rio Grande	72	13S.04W.22.300	33.161667	-107.2439	
330942107143101					Rio Grande		13S.04W.22.300+DUP	33.161667	-107.2419	
330933107144301	19600122	140			Rio Grande	140	13S.04W.22.330	33.159167	-107.2453	
330904107144101					Rio Grande	100	13S.04W.22.330+DUP	33.151111	-107.2447	
330933107144302	19600628	47			Rio Grande	90	13S.04W.22.330A	33.159167	-107.2453	
330937107144601	19660524	67			Rio Grande	100	13S.04W.22.331	33.160278	-107.2461	

[a]Negative depth to water indicates water level above land surface datum

[b]Roybal (1991)

[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
330943107135301	19680204	48			Rio Grande	82	13S.04W.22.424	33.161944	-107.2314	
330848107133501	19580326	25			Rio Grande	26	13S.04W.26.300	33.146667	-107.2264	
330842107132801	19650407	7			Rio Grande	34	13S.04W.26.340	33.145	-107.2244	
330854107145301					Rio Grande		13S.04W.28.420	33.148333	-107.2481	
330809107151902					Rio Grande		13S.04W.33	33.135833	-107.2553	
331322107152201					Rio Grande		13S.04W.33.000	33.222222	-107.2556	
330809107151901					Rio Grande		13S.04W.33.000+DUP	33.136111	-107.2556	
330746107153801					Rio Grande		13S.04W.33.334	33.129444	-107.2606	
330750107152701					Rio Grande	147	13S.04W.33.340	33.130556	-107.2575	
330747107152001	19400615	-0.85			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19401023	-0.14			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19410226	-0.57			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19410621	-0.52			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19411025	-0.95			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19420317	-1.2			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19420819	-0.95			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19421124	-0.83			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19430428	-0.83			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19430708	-0.56			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19431010	-0.24			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19440106	-0.3			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19440411	-0.44			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19440622	-0.35			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19440915	-0.13			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19441120	-0.44			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19450102	-0.7			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19450319	-0.71			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19450513	-0.7			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19450719	-0.2			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19450910	-0.32			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19460521	-0.03			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19460723	-0.05			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19460926	-0.09			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	

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330747107152001	19461105	-0.22			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19470121	-0.36			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19470326	-0.39			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19470730	-0.08			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19471105	0.1			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19480117	-0.27			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19480326	-0.53			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19480528	-0.48			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19480720	-0.33			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19480915	0.05			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19481115	0.34			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19490104	0.35			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19490314	0.09			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19490516	-0.06			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19490719	0.25			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19490906	0.29			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19510129	0.14			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19520131	0.58			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19530105	0.79			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19540105	1.23			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19550114	0.54			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19560123	0.93			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19570107	1.35			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19580106	-0.43			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19590106	-0.58			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19600104	0.41			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19610120	0.79			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19620102	0.95			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19630103	0.86			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19640106	1.11			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19650104	1.1			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19660124	1.05			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19670112	0.95			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	

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330747107152001	19680117	0.8			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19690106	0.65			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152001	19700120	2.52			Rio Grande	125	13S.04W.33.344	33.130556	-107.2556	
330747107152002	19400615	-0.9			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19401023	-0.18			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19410226	-0.62			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19410621	-0.57			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19411025	-0.98			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19420317	-1.23			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19420819	-1			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19421124	-0.88			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19430428	-0.88			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19430708	-0.6			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19431010	-0.29			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19440106	-0.35			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19440411	-0.48			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19440622	-0.39			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19440915	-0.17			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19441120	-0.5			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19450102	-0.75			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19450319	-0.75			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19450513	-0.74			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19450719	-0.25			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19450910	-0.36			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19460521	-0.07			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19460723	-0.09			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19460926	-0.12			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19461105	-0.26			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19470121	-0.41			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19470326	-0.43			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19470730	-0.11			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19470930	-0.04			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19471105	0.04			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	

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330747107152002	19480117	-0.3			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19480326	-0.57			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19480528	-0.53			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19480720	-0.36			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19490104	0.3			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19490314	0.04			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19490516	-0.1			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19490719	0.22			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19490906	0.29			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19491129	0.06			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19510129	0.11			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19520131	0.58			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19530105	0.75			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19540105	1.23			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19550114	0.58			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19560123	1.05			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19570107	1.41			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19580106	-0.35			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19590106	-0.68			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19600104	0.53			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19610120	0.69			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19620102	0.84			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19630102	0.88			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19640106	1.18			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19650104	1.09			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19660124	1.59			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19670112	0.89			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19680117	0.96			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19690106	0.39			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330747107152002	19700120	2.1			Rio Grande	125	13S.04W.33.344 A	33.130556	-107.2556	
330746107152601					Rio Grande		13S.04W.33.344+DUP	33.129444	-107.2572	
330757107150201					Rio Grande		13S.04W.33.400	33.1325	-107.2506	
330747107151901	19390329	1.92			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330747107151901	19390413	1.55			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19390427	2.46			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19390616	1.58			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19390913	1.63			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19391201	1.98			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19400228	1.85			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19400406	1.45			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19400426	1.42			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19400615	1.4			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19401023	2.03			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19410226	1.65			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19410621	1.68			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19411025	1.34			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19420317	1.19			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19420819	1.38			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19421124	1.49			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19430428	1.45			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19430708	1.62			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19431010	0.86			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19440106	1.76			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19440411	1.69			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19440622	1.78			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19440915	1.89			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19441120	1.61			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19450102	1.45			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19450319	1.45			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19450513	1.54			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19450719	1.8			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19450910	1.79			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19451121	1.88			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19460106	1.77			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19460327	1.72			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19460521	1.77			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	

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[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330747107151901	19460626	1.93			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19460723	2.07			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19461105	1.83			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19470121	1.76			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19470326	1.7			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19470529	1.82			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19470730	1.95			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19470930	2.1			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19471104	2.08			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19480117	1.85			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19480326	1.58			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19480528	1.63			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19480720	1.72			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19480915	2.05			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19481115	2.31			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19490104	2.29			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19490314	2.05			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19490516	1.98			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19490719	1.96			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19490906	2.23			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19491129	2.11			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19500123	2			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19510129	2.09			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19520131	2.41			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19530105	2.57			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19540105	2.96			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19550114	2.43			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19560123	2.72			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19570107	2.92			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19580106	1.72			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19590106	1.48			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19600104	2.35			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19610120	2.45			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	

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[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330747107151901	19620102	2.63			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19630102	2.6			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19640106	2.73			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19650104	2.36			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19660124	3.91			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19670112	3.6			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19671012	3.6			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19680117	1.4			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19690106	3.15			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330747107151901	19700120	2.87			Rio Grande	55	13S.04W.33.433	33.130556	-107.2556	
330745107150801	19390322	1.73			Rio Grande	101	13S.04W.33.433+DUP	33.129167	-107.2522	
330752107151801	19390228	-0.93			Rio Grande	258	13S.04W.33.434	33.131111	-107.255	
330747107150502	19390328	1.41			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19390413	1.07			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19390427	0.91			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19390616	1.07			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19390913	1.2			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19391201	1.53			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19400228	1.48			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19400406	1.05			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19400426	0.95			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19400615	0.96			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19401023	1.7			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19410226	1.26			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19410621	1.31			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19411025	0.9			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19420317	0.63			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19420819	0.82			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19421124	0.97			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19430428	0.98			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19431010	1.52			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19440106	1.44			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19440411	1.34			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
330747107150502	19440622	1.37			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19440915	1.62			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19441120	1.23			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19450102	1.01			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19450319	1.04			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19450513	1.09			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19450719	1.39			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19450910	1.42			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19451121	1.56			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19460106	1.47			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19460327	1.39			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19470121	1.42			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19470326	1.33			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19470529	1.46			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19470730	1.65			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19470930	1.81			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19471104	1.76			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19480117	1.49			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19480326	1.23			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19480528	1.26			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19480720	1.43			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19480915	1.77			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19481115	2.07			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19490104	2.07			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19490314	1.73			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19490719	1.7			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19490906	2			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19491129	1.88			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19500123	1.76			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19510129	1.78			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19520131	2.26			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19530105	2.72			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19540105	3.27			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330747107150502	19550114	2.7			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19560123	2.79			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19570107	3.37			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19580106	1.72			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19590106	0.98			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19600104	2.06			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19610120	2.33			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19620102	2.55			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19630102	2.53			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19640104	2.88			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19640106	2.7			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19660124	2.66			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19670112	2.53			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19680117	2.09			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330747107150502	19700120	3.63			Rio Grande	125	13S.04W.33.434 A	33.130556	-107.2528	
330748107150901					Rio Grande		13S.04W.33.434+DUP	33.13	-107.2525	
330752107151803					Rio Grande		13S.04W.33.434B	33.131111	-107.255	
330759107144601	19390330	-6			Rio Grande	120	13S.04W.34.313	33.133056	-107.2461	
330755107141301					Rio Grande		13S.04W.34.400	33.131944	-107.2375	
330828107133401	19690627	6			Rio Grande	38	13S.04W.35.100	33.141111	-107.2261	
330828107133402	19600919	20			Rio Grande	20	13S.04W.35.100A	33.141111	-107.2261	
330828107133403	19630216	6			Rio Grande	43	13S.04W.35.100B	33.141667	-107.2264	
330828107133404	19621003	40			Rio Grande	40	13S.04W.35.100C	33.141111	-107.2261	
330812107134701	19790209	8			Rio Grande	57	13S.04W.35.133	33.136667	-107.2297	
331212107180001	19751025	70			Rio Grande	168	13S.05W.01.440	33.203333	-107.3	
330843107240301	19410101	20			Rio Grande		13S.05W.30.331	33.145278	-107.4008	
331133107263901	19810101	70			Rio Grande	150	13S.06W.10.321	33.1925	-107.4442	
331128107263901	19810217	72.88			Rio Grande	150	13S.06W.10.413	33.191111	-107.4442	
331027107242701	19810217	311.26			Rio Grande		13S.06W.13.4321	33.174167	-107.4075	
331028107244301	19840229	306.43			Rio Grande		13S.06W.13.4331	33.175	-107.4111	
330954107241101	19490101	294			Rio Grande	339	13S.06W.24.244	33.165	-107.4031	
330819107322701					Rio Grande		13S.07W.34.230	33.138611	-107.5408	
330738107143001					Rio Grande	100	14S.04W.03.121	33.127222	-107.2417	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330711107151801							14S.04W.04.000	33.119444	-107.2556	
330739107152901					Rio Grande		14S.04W.04.121	33.127778	-107.2583	
330740107152301					Rio Grande		14S.04W.04.122	33.127778	-107.2564	
330740107152302					Rio Grande	60	14S.04W.04.122A	33.127778	-107.2564	
330740107152303					Rio Grande	135	14S.04W.04.122B	33.127778	-107.2564	
330732107153101	19560723	5.88				100	14S.04W.04.123	33.125556	-107.2586	
330736107151301					Rio Grande		14S.04W.04.200	33.126389	-107.2542	
330735107151201					Rio Grande	208	14S.04W.04.210	33.126389	-107.2533	
330740107151601	19400406	-0.77			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19400426	-0.78			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19400615	-0.76			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19401023	-0.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410101	-0.45			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410201	-0.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410226	-0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410301	-0.56			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410401	-0.63			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410501	-0.66			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410526	-0.46			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410601	-0.58			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410621	-0.51			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410701	-0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410801	-0.66			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19410901	-0.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19411001	-0.8			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19411025	-0.92			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19411101	-1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19411201	-1.58			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420101	-1.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420201	-1.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420301	-1.53			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420317	-1.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420406	-1.34			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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330740107151601	19420407	-1.38			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420418	-1.48			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420512	-2.7			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420601	-2.94			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420614	-2.16			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420629	-2.18			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420701	-2.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420801	-1.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420818	-1.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420819	-1.23			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420901	-1.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19420915	-0.99			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19421003	-1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19421017	-0.94			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19421101	-1.08			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19421124	-1.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19421201	-1.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430101	-1.14			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430105	-1.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430301	-1.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430401	-1.07			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430423	-1.03			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430428	-1.06			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430501	-1.05			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430601	-0.96			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430707	-0.77			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430708	-0.85			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430801	-0.79			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430809	-0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19430901	-0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19431004	-0.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19431009	-0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19431010	-0.58			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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330740107151601	19431101	-0.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19431201	-0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440101	-0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440106	-0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440201	-0.66			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440301	-0.71			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440401	-0.77			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440411	-0.73			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440501	-0.78			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440601	-0.74			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440608	-0.61			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440622	-0.65			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440701	-0.7			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440801	-0.65			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440901	-0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440911	-0.44			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19440915	-0.52			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19441001	-0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19441101	-0.77			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19441120	-0.8			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19441201	-0.9			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450101	-1.02			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450102	-1.01			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450201	-1.04			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450301	-1.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450319	-1.01			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450401	-1.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450501	-1.02			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450510	-0.92			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450513	-0.95			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450601	-0.93			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450701	-0.82			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450716	-0.69			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19450719	-0.62			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450801	-0.75			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450901	-0.72			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19450910	-0.63			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19451001	-0.56			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19451025	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19451101	-0.62			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19451121	-0.48			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19451201	-0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460101	-0.65			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460106	-0.61			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460201	-0.63			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460301	-0.6			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460326	-0.63			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460401	-0.71			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460501	-0.7			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460521	-0.66			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460601	-0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460701	-0.56			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460723	-0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460801	-0.45			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460824	-0.23			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460901	-0.44			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19460926	-0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19461001	-0.51			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19461101	-0.65			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19461105	-0.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19461201	-0.61			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470101	-0.72			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470121	-0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470201	-0.65			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470301	-0.73			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470326	-0.6			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

[a]Negative depth to water indicates water level above land surface datum

[b]Roybal (1991)

[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19470401	-0.67			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470501	-0.71			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470529	-0.61			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470601	-0.6			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470701	-0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470730	-0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470801	-0.47			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19470930	-0.35			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19471001	-0.38			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19471101	-0.41			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19471105	-0.31			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19471201	-0.46			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480101	-0.48			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480117	-0.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480201	-0.68			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480301	-0.82			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480326	-0.8			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480401	-0.87			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480501	-0.82			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480528	-0.81			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480601	-0.8			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480701	-0.73			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480720	-0.68			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480801	-0.68			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480901	-0.62			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19480915	-0.36			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19481003	-0.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19481115	-0.08			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19481201	-0.16			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490104	-0.11			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490201	-0.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490304	-0.33			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490314	-0.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19490401	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490406	-0.31			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490501	-0.53			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490516	-0.38			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490601	-0.56			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490701	-0.53			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490718	-0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490802	-0.33			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490901	-0.19			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19490906	-0.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19491001	-0.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19491101	-0.29			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19491129	-0.31			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19491201	-0.35			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500101	-0.37			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500123	-0.28			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500201	-0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500301	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500315	-0.36			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500401	-0.53			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500501	-0.49			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500515	-0.36			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500601	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500701	-0.36			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500717	-0.37			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500801	-0.32			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500901	-0.18			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19500928	0.06			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19501001	0.01			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19501101	0.04			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19501127	0.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19501201	-0.01			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510101	-0.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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[b]Roybal (1991)

[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19510129	-0.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510201	-0.35			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510301	-0.53			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510320	-0.45			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510401	-0.62			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510501	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510507	-0.33			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510601	-0.33			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510701	-0.33			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510731	-0.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510801	-0.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510901	-0.05			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19510911	0.12			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19511001	0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19511101	0.51			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19511115	0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19511201	0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520101	0.48			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520131	0.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520201	0.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520301	-0.07			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520331	-0.08			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520401	-0.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520501	-0.23			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520601	-0.43			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520701	-0.48			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520724	-0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520801	-0.43			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520901	0.04			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520902	0.21			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19520912	0.11			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19521001	0.31			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19521101	0.53			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19521104	0.61			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19521201	0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530104	0.23			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530105	0.22			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530201	-0.12			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530301	-0.35			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530324	-0.32			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530401	-0.46			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530501	-0.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530506	0.08			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530601	0			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530701	-0.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530713	-0.12			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530801	-0.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530901	0.01			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19530914	0.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19531001	0.53			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19531101	0.63			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19531109	0.72			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19531201	0.5			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540101	0.5			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540105	0.67			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540201	0.49			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540301	0.49			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540315	0.26			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540401	0.04			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540501	0.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540528	0.21			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540601	0.06			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540701	0.19			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540712	0.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540801	0.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19540901	0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19540908	0.62			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19541001	0.61			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19541101	0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19541118	0.56			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19541201	0.23			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550103	0.03			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550114	0.22			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550201	0.07			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550301	0.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550315	0.12			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550401	-0.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550501	-0.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550516	0.22			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550601	0.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550701	-0.08			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550801	0.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550802	0.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550901	-0.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19550906	-0.11			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19551001	0.21			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19551101	0.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19551107	0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19551201	0.18			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560105	0.18			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560122	0.19			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560205	0.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560305	-0.04			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560405	-0.43			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560505	-0.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560508	-0.03			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560605	0			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560705	0.03			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560706	0.18			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19560709	0.08			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560805	0.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19560905	0.02			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19561005	0.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19561105	0.7			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19561107	0.76			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19561205	0.7			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570105	0.66			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570107	0.75			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570205	0.68			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570305	0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570306	0.74			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570404	0.26			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570405	0.19			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570505	0.36			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570605	0.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570614	0.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570705	-0.07			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570805	-0.28			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570806	-0.27			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19570905	-0.3			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19571005	-0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19571105	-0.69			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19571113	-0.72			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19571205	-0.8			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580105	-0.89			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580106	-0.8			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580205	-1.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580305	-1.3			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580405	-1.47			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580415	-1.45			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580505	-1.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580605	-1.61			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19580705	-1.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580729	-1.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19580805	-1.5			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19581005	-1.02			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19581105	-1.05			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19581112	-0.98			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19581205	-1.11			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590105	-1.09			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590106	-0.99			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590205	-1.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590305	-1.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590405	-1.1			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590414	-0.89			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590505	-0.86			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590605	-0.71			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590705	-0.8			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590803	-0.75			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590805	-0.81			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19590905	-0.58			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19591005	-0.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19591102	-0.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19591105	-0.26			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19591205	-0.18			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600104	-0.14			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600105	-0.23			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600205	-0.45			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600305	-0.58			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600404	-0.72			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600405	-0.77			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600505	-0.82			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600605	-0.71			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600705	-0.7			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600801	-0.38			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19600805	-0.5			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19600905	-0.51			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19601005	0.08			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19601105	0.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19601108	0.23			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19601205	0.07			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610101	-0.02			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610120	0.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610201	-0.05			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610301	-0.51			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610331	-0.62			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610401	-0.69			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610403	-0.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610501	-0.63			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610601	-0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610621	-0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610701	-0.5			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610801	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610807	-0.38			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19610901	-0.37			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19611001	0.26			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19611101	0.34			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19611106	0.46			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19611201	0.3			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620101	0.31			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620102	0.3			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620201	0.21			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620301	0.3			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620401	0.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620402	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620501	-0.71			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620515	-0.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620601	-0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

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Summary of Well, Water Level, and Well Yield Data for
La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19620701	-0.66			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620801	-0.49			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620813	-0.19			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19620901	-0.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19621001	0.01			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19621101	0.28			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19621201	0.17			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630101	0.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630102	0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630201	0.16			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630301	-0.35			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630401	-0.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630501	-0.74			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630601	-0.57			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630701	-0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630801	-0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630805	-0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19630901	-0.34			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19631001	0.31			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19631101	0.44			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19631201	0.42			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640101	0.41			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640106	0.59			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640201	0.44			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640301	0.4			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640401	0.35			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640501	0.27			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640601	1.25			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640701	1.49			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640801	1.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640808	0.13			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19640901	1.62			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19641001	1.34			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330740107151601	19641101	0.64			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19641201	0.49			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650101	0.54			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650104	0.52			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650201	0.55			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650301	0.52			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650406	0.04			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650501	-0.02			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650601	-0.06			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650701	0.04			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650801	0.15			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650812	-0.3			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19650901	-0.28			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19651001	0.32			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19651101	0.89			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19651201	0.84			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19660101	0.79			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19660124	0.37			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19660201	0.24			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19660301	0.81			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19660401	-0.69			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19660501	-0.66			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19670112	0.39			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19680118	-0.2			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19690106	0.45			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19700120	-0.47			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19710209	0.73			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330740107151601	19720210	1.58			Rio Grande	105	14S.04W.04.211	33.127778	-107.2556	
330737107152803	19410526	1.8			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19410621	1.77			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19411025	1.42			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19420317	1.32			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19420406	1.39			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330737107152803	19420418	1.22			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19420629	0.6			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19420818	1.41			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19420819	1.38			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19420915	1.36			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19421017	1.55			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19421124	1.51			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19430105	1.49			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19430423	1.5			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19430428	1.5			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19430707	1.6			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19430708	1.57			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19430809	1.76			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19431009	1.74			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19440106	1.63			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19440411	1.59			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19440608	1.7			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19440622	1.75			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19440911	1.83			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19440915	1.79			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19441120	1.52			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19450102	1.41			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19450319	1.44			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19450510	1.58			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19450513	1.57			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19450716	1.74			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19450719	1.7			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19450910	1.76			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19451025	1.74			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19451121	1.73			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19460106	1.62			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19460326	1.66			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19460521	1.77			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330737107152803	19460723	1.92			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19460824	1.84			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19460926	1.83			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19461105	1.69			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19470121	1.66			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19470326	1.66			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19470529	1.77			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19470730	1.9			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19470930	2.02			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19471105	2			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19480117	1.83			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19480326	1.53			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19480528	1.61			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19480531	1.64			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19480720	1.65			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19480915	1.93			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19481115	2.14			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19490104	2.08			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19490314	1.94			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19490407	1.97			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19490516	1.86			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19490718	1.84			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19490802	1.94			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19490906	0.87			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19491129	1.93			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19500123	1.87			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19500315	1.81			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19500515	1.89			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19500726	1.9			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19500928	1.99			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19501127	2.31			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19510129	1.91			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19510320	1.78			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330737107152803	19510507	1.94			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19510731	2.06			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19510911	2.21			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19511115	2.63			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19520131	2.23			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19520331	2.09			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19520516	1.9			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19520724	1.81			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19520902	2.2			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19520912	2.18			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19521104	2.71			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19530105	2.38			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19530324	1.61			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19530506	1.88			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19530713	-0.16			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19530914	2.1			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19531109	2.72			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19540105	2.62			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19540315	2.37			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19540528	1.74			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19540712	2.27			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19540908	2.41			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19541118	2.47			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19550114	2.25			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19550315	2.23			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19550516	2.23			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19550802	1.21			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19550906	1.73			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19551107	2.47			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19560122	2.3			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19560305	2.14			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19560508	1.97			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19560709	1.97			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330737107152803	19560906	2.16			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19561107	2.73			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19570107	2.63			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19570306	2.53			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19570404	1.95			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19570505	1.31			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19571113	1.77			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19580106	1.37			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19580415	0.93			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19580729	0.26			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19581112	1.26			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19581121	1.41			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19590106	1.43			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19590414	1.39			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19590803	1.53			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19591102	2.03			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19600104	2.13			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19600404	1.46			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19600801	1.05			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19601108	1.8			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19610120	1.91			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19610331	0.65			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19610403	1.5			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19610622	1.93			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19610807	1.67			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19611106	2.37			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19620102	2.23			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19620402	1.49			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19620813	1.71			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19630102	2.21			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19630805	1.57			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19640106	2.32			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19640808	1.97			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330737107152803	19650104	2.35			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19650812	1.56			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152803	19660124	1.55			Rio Grande	6	14S.04W.04.211 A	33.127778	-107.2583	
330737107152802	19410526	1.8			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19410621	1.77			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19411025	1.42			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19420317	1.32			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19420406	1.39			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19420418	1.22			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19420629	0.6			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19420818	1.41			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19420819	1.38			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19420915	1.36			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19421017	1.55			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19421124	1.51			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19430105	1.49			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19430423	1.5			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19430428	1.5			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19430707	1.6			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19430708	1.57			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19430809	1.76			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19431009	1.74			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19440106	1.63			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19440411	1.59			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19440608	1.7			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19440622	1.75			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19440911	1.83			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19440915	1.79			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19441120	1.52			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19450102	1.41			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19450319	1.44			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19450510	1.58			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19450513	1.57			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330737107152802	19450716	1.74			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19450719	1.7			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19450910	1.76			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19451025	1.74			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19451121	1.73			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19460106	1.62			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19460326	1.66			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19460521	1.77			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19460723	1.92			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19460824	1.84			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19460926	1.83			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19461105	1.69			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19470121	1.66			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19470326	1.66			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19470529	1.77			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19470730	1.9			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19470930	2.02			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19471105	2			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19480117	1.83			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19480326	1.53			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19480528	1.61			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19480531	1.64			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19480720	1.65			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19480915	1.93			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19481115	2.14			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19490104	2.08			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19490314	1.94			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19490407	1.97			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19490516	1.86			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19490718	1.84			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19490802	1.94			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19490906	0.87			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19491129	1.93			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
330737107152802	19500123	1.87			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19500315	1.81			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19500515	1.89			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19500726	1.9			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19500928	1.99			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19501127	2.31			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19510129	1.91			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19510320	1.78			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19510507	1.94			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19510731	2.06			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19510911	2.21			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19511115	2.63			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19520131	2.23			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19520331	2.09			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19520516	1.9			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19520724	1.81			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19520902	2.2			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19520912	2.18			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19521104	2.71			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19530105	2.38			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19530324	1.61			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19530506	1.88			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19530713	0.16			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19530914	2.1			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19531109	2.72			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19540105	2.62			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19540315	2.37			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19540528	1.74			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19540712	2.27			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19540908	2.41			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19541118	2.47			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19550114	2.25			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19550315	2.23			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330737107152802	19550516	2.23			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19550802	1.21			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19550906	1.73			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19551107	2.47			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19560122	2.3			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19560305	2.14			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19560508	1.97			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19560709	1.97			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19560906	2.16			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19561107	2.73			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19570107	2.63			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19570306	2.53			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19570404	1.95			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19570505	1.31			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19571113	1.77			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19580106	1.37			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19580415	0.93			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19580729	0.26			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19581112	1.26			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19581121	1.41			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19590106	1.43			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19590414	1.39			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19590803	1.53			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19591102	2.03			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19600104	2.13			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19600404	1.46			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19600801	1.05			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19601108	1.8			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19610120	1.91			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19610331	0.65			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19610403	1.5			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19610622	1.93			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19610807	1.67			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
330737107152802	19611106	2.37			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19620102	2.23			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19620402	1.49			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19620813	1.71			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19630102	2.21			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19630805	1.57			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19640106	2.32			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19640808	1.97			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19650104	2.35			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19650812	1.56			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330737107152802	19660124	1.55			Rio Grande	6	14S.04W.04.211A	33.127778	-107.2583	
330739107150702					Rio Grande	10	14S.04W.04.212	33.1275	-107.2519	
330739107150701	19390329	0.72			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19390413	0.35			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19390427	0.25			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19390616	0.4			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19390913	0.47			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19391201	0.76			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19400228	0.66			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19400406	0.23			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19400426	0.12			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19400615	0.16			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19401023	0.86			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19410226	0.44			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19410621	0.45			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19411025	0.09			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19420317	-0.13			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19420819	0.12			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19421124	0.21			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19430428	0.21			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19430708	0.45			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19431010	0.73			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19440106	0.72			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	

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[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
330739107150701	19440411	0.65			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19440622	0.7			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19440915	0.89			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19441120	0.55			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19450102	0.32			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19450319	0.34			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19450513	0.4			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19450719	0.75			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19450910	0.72			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19451121	0.82			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19460106	0.8			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19460521	1.04			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19460723	0.96			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19461105	0.83			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19470121	0.69			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19470326	0.64			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19470730	0.9			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19470930	1.04			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19471104	4.31			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19480117	0.76			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19480326	0.46			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19480528	0.55			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19480720	0.65			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19480915	1.09			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19490104	1.29			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19490314	1.15			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19490516	1.06			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19490719	1.43			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19490906	1.52			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19491129	1.07			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19500123	1.32			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19510129	1			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19520131	1.76			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	

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[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330739107150701	19530105	1.61			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19540105	1.97			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19550114	1.39			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19560123	1.59			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19570107	1.94			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19580106	0.46			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19590106	0.28			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19600104	1.18			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19610120	1.49			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19620102	1.64			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19630102	1.56			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19640106	1.72			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19650104	1.76			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19670112	1.56			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19680117	1			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19690106	3.01			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330739107150701	19700120	2.39			Rio Grande	125	14S.04W.04.212 A	33.127778	-107.2528	
330732107151501						335	14S.04W.04.213	33.125556	-107.2542	
330725107152802	19400201	1.62				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19410301	1.71				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19410401	1.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19410501	1.63				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19410601	1.73				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19410707	1.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19410801	1.56				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19410901	1.65				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19411001	1.16				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19411101	1.41				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19411202	1.19				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420101	1.27				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420201	1.26				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420301	1.25				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420401	1.36				6	14S.04W.04.213A	33.125	-107.2583	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330725107152802	19420501	0.17				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420601	-0.45				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420701	0.45				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420801	1.17				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19420915	1.3				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19421001	1.58				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19421101	1.55				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19421201	1.5				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430101	1.46				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430209	1.46				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430301	1.45				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430401	1.48				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430503	1.5				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430601	1.55				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430701	1.59				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430801	1.67				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19430901	1.74				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19431001	1.71				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19431101	1.71				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19431201	1.66				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440101	1.55				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440201	1.61				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440301	1.58				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440401	1.57				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440501	1.58				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440601	1.68				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440701	1.64				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440801	1.7				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19440901	1.77				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19441001	1.47				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19441101	1.58				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19441201	1.47				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450101	1.38				6	14S.04W.04.213A	33.125	-107.2583	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude Longitude		Reported or Estimated Yield (gpm)
330725107152802	19450204	1.4				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450301	1.39				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450401	1.4				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450501	1.5				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450601	1.61				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450701	1.37				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450801	1.72				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19450901	1.71				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19451001	1.78				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19451101	1.72				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19451201	1.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460101	1.62				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460301	1.65				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460401	1.64				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460501	1.7				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460601	1.77				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460701	1.89				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460801	1.9				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19460901	1.83				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19461001	1.8				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19461101	1.63				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19461201	1.67				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470101	1.65				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470201	1.65				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470301	1.61				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470401	1.63				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470501	1.65				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470601	1.78				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470701	1.63				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470801	1.89				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19470901	1.88				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19471005	2.02				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19471102	2				6	14S.04W.04.213A	33.125	-107.2583	

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330725107152802	19471201	1.95				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480101	1.94				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480201	1.67				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480301	1.58				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480401	1.54				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480507	1.52				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480601	1.62				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480701	1.62				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480801	1.65				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19480901	1.67				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19481002	2.05				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19481115	2.15				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19481201	2.1				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490104	2.08				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490201	2.03				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490304	1.96				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490401	1.92				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490501	1.88				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490601	1.76				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490701	1.78				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490802	1.94				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19490901	2.08				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19491001	1.95				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19491101	2.01				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19491201	1.93				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500101	1.88				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500201	1.87				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500301	1.85				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500401	1.76				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500501	1.83				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500601	1.9				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500726	1.9				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19500801	1.56				6	14S.04W.04.213A	33.125	-107.2583	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330725107152802	19500901	2.11				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19501001	2.16				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19501101	2.36				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19501201	2.29				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510105	2.15				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510205	1.89				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510305	1.8				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510405	1.61				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510505	1.92				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510605	2.06				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510705	2.04				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510805	1.9				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19510905	2.15				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19511005	2.6				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19511105	2.3				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19511205	2.66				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520101	2.59				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520201	2.23				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520301	2.08				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520401	2.09				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520501	1.97				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520601	1.54				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520701	1.78				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520801	1.79				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19520901	2.12				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19521001	2.27				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19521101	2.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19521201	2.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530101	2.4				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530201	2.05				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530301	-1.13				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530401	1.68				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530501	1.31				6	14S.04W.04.213A	33.125	-107.2583	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330725107152802	19530601	2.03				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530701	2.13				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530801	1.89				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19530901	1.52				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19531001	2.58				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19531101	2.72				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19531201	2.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540101	2.63				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540201	2.59				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540301	2.55				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540401	2.14				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540501	2.04				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540601	1.95				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540701	2.31				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540801	2.31				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19540901	1.78				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19541001	2.68				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19541101	2.55				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19541201	2.42				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550109	2.25				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550201	2.25				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550301	2.27				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550401	2.01				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550501	2.04				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550601	2.35				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550701	2.13				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550801	0.97				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19550901	1.52				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19551001	2.3				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19551101	2.42				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19551201	2.55				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560105	2.29				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560205	2.3				6	14S.04W.04.213A	33.125	-107.2583	

[a]Negative depth to water indicates water level above land surface datum

[b]Roybal (1991)

[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330725107152802	19560305	2.13				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560405	1.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560505	1.9				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560605	2.24				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560705	1.84				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560805	0.92				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19560905	2.18				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19561005	2.6				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19561105	2.74				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19561205	2.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570105	2.63				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570205	2.6				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570305	2.54				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570405	1.96				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570505	1.38				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570605	2.53				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570705	1.99				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570805	1.21				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19570905	0.85				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19571005	1.79				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19571105	1.76				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19571205	1.7				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580105	1.35				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580205	1.2				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580305	-0.06				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580405	0.89				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580505	0.96				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580605	0.57				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580705	0.93				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19580805	0.78				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19581005	0.75				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19581105	0.97				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19581205	1.41				6	14S.04W.04.213A	33.125	-107.2583	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330725107152802	19590105	1.42				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590205	1.35				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590305	1.33				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590405	1.33				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590505	1.48				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590605	1.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590705	1.64				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590805	1.53				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19590905	1.53				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19591005	1.84				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19591105	2.05				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19591205	2.17				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600105	2.12				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600205	1.79				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600305	1.69				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600405	1.45				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600505	1.43				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600605	1.54				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600705	-1.37				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600805	1.26				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19600905	1.67				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19601205	0				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610101	1.12				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610201	2.05				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610301	1.74				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610403	1.44				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610501	1.47				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610601	1.56				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610701	1.59				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610801	1.62				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19610901	1.64				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19611001	2.24				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19611101	2.33				6	14S.04W.04.213A	33.125	-107.2583	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330725107152802	19611201	2.23				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620101	2.24				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620105	1.32				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620201	2.17				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620301	1.71				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620401	1.47				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620601	1.46				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620701	1.44				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620801	-0.76				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19620901	1.8				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19621001	0.39				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19621101	2.14				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19621201	-1.31				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630101	2.21				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630201	2.16				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630301	1.65				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630401	1.53				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630501	1.31				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630601	1.57				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630701	1.75				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630801	1.66				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19630901	-0.44				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640201	2.27				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640301	2.25				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640401	2.08				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640501	1.8				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640608	2.24				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640701	2.06				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640801	-1.42				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19640901	1.91				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19641001	2.12				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19641101	2.32				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19641201	2.3				6	14S.04W.04.213A	33.125	-107.2583	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330725107152802	19650101	2.35				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650201	2.35				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650301	2.3				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650406	1.83				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650501	1.27				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650601	1.62				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650701	1.35				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650801	1.22				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19650901	1.64				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19651001	2.16				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19651101	2.33				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19651201	2.28				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19660101	2.2				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19660201	1.92				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19660301	2.46				6	14S.04W.04.213A	33.125	-107.2583	
330725107152802	19660401	2.65				6	14S.04W.04.213A	33.125	-107.2583	
330734107150501						20	14S.04W.04.214	33.126111	-107.2514	
330725107151401	19630102	2.54					14S.04W.04.214+DUP	33.125	-107.2528	
330725107151401	19640203	4.41					14S.04W.04.214+DUP	33.125	-107.2528	
330725107151401	19650106	2.65					14S.04W.04.214+DUP	33.125	-107.2528	
330725107151401	19660124	2.03					14S.04W.04.214+DUP	33.125	-107.2528	
330725107151401	19670112	1.65					14S.04W.04.214+DUP	33.125	-107.2528	
330725107151401	19680117	2.46					14S.04W.04.214+DUP	33.125	-107.2528	
330725107151401	19700120	0.39					14S.04W.04.214+DUP	33.125	-107.2528	
330734107150502						176	14S.04W.04.214A+DUP2	33.126111	-107.2514	
330725107151402	19630102	-2.54					14S.04W.04.214A+DUP3	33.125	-107.2528	
330725107151402	19640203	-4.41					14S.04W.04.214A+DUP3	33.125	-107.2528	
330725107151402	19650106	-2.65					14S.04W.04.214A+DUP3	33.125	-107.2528	
330725107151402	19660124	-2.03					14S.04W.04.214A+DUP3	33.125	-107.2528	
330725107151402	19670112	-1.65					14S.04W.04.214A+DUP3	33.125	-107.2528	
330725107151402	19680117	-2.46					14S.04W.04.214A+DUP3	33.125	-107.2528	
330725107151402	19700120	-0.39					14S.04W.04.214A+DUP3	33.125	-107.2528	
330722107162601						66	14S.04W.05.142	33.122778	-107.2739	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330735107161301	19560229	86.2			Rio Grande	140	14S.04W.05.210	33.126389	-107.2703	
330708107160101							14S.04W.05.221A	33.119444	-107.2667	
330716107155801							14S.04W.05.240	33.122222	-107.2667	
330723107161501	19480124	70.33				138	14S.04W.05.241	33.122222	-107.2722	
330705107161201	19460619	8.45				40	14S.04W.05.310	33.118056	-107.27	
330658107164701	19460619	8.45				40	14S.04W.05.310+DUP	33.116667	-107.2806	
330658107164701	19470129	8.26				40	14S.04W.05.310+DUP	33.116667	-107.2806	
330658107164701	19480124	9.69				40	14S.04W.05.310+DUP	33.116667	-107.2806	
330658107164701	19490209	9.17				40	14S.04W.05.310+DUP	33.116667	-107.2806	
330658107164701	19890215	14.9				40	14S.04W.05.310+DUP	33.116667	-107.2806	
330652107162901							14S.04W.05.340	33.114444	-107.2747	
330735107174201	19670321	82.14			Rio Grande		14S.04W.06.110	33.126389	-107.295	
330725107175002	19470122	98.28			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19480124	98.15			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19490209	100.66			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19490314	99.15			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19490516	101.51			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19490719	100.38			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19490906	99.36			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19500123	100.42			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19510129	99.93			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19520131	99.38			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19530105	95.1			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19540130	100.34			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19550114	99.47			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19560123	99.73			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19570107	100.66			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19590107	98.25			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19600104	99.44			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19610120	100.26			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19620102	100.43			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19630102	101.85			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19640204	97.55			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	

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Summary of Well, Water Level, and Well Yield Data for La Jencia and Rio Grande Basins in Study Area

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330725107175002	19650104	104.5			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19680118	100.51			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19690106	102.06			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330725107175002	19700120	102.38			Rio Grande	334	14S.04W.06.110A	33.125	-107.2972	
330720107173401						438	14S.04W.06.143	33.122222	-107.2928	
330729107170701	19500101	50					14S.04W.06.200	33.124722	-107.2853	
330729107170701	19620312	66.33					14S.04W.06.200	33.124722	-107.2853	
330720107171601	19451010	-35				278	14S.04W.06.233	33.122222	-107.2878	
330720107171602						1000	14S.04W.06.233A	33.122222	-107.2878	
330711107173302	19450414	-21.07				300	14S.04W.06.233A+DUP	33.119444	-107.2917	
330711107173302	19451010	-32.7				300	14S.04W.06.233A+DUP	33.119444	-107.2917	
330711107173302	19451014	-12.1				300	14S.04W.06.233A+DUP	33.119444	-107.2917	
330711107173302	19451218	-38.9				300	14S.04W.06.233A+DUP	33.119444	-107.2917	
330711107173302	19460522	14.1				300	14S.04W.06.233A+DUP	33.119444	-107.2917	
330711107173302	19460815	13.2				300	14S.04W.06.233A+DUP	33.119444	-107.2917	
330711107173302	19480124	39.22				300	14S.04W.06.233A+DUP	33.119444	-107.2917	
330720107171603						298	14S.04W.06.233B	33.122222	-107.2878	
330719107171001						230	14S.04W.06.234	33.121944	-107.2861	
330712107171803	19590107	-10.99				404	14S.04W.06.234 B	33.119444	-107.2889	
330712107171803	19600105	-12.04				404	14S.04W.06.234 B	33.119444	-107.2889	
330712107171803	19610121	-10.19				404	14S.04W.06.234 B	33.119444	-107.2889	
330712107171803	19620102	-11.49				404	14S.04W.06.234 B	33.119444	-107.2889	
330712107171803	19630103	-8.8				404	14S.04W.06.234 B	33.119444	-107.2889	
330712107171803	19650105	-0.65				404	14S.04W.06.234 B	33.119444	-107.2889	
330719107171002						268	14S.04W.06.234A	33.121944	-107.2861	
330719107171003	19580718	12.46				403	14S.04W.06.234B	33.121944	-107.2861	
330719107171003	19631030	16.05				403	14S.04W.06.234B	33.121944	-107.2861	
330711107171803	19590107	10.99				404	14S.04W.06.234B+DUP	33.119444	-107.2889	
330711107171803	19600105	12.04				404	14S.04W.06.234B+DUP	33.119444	-107.2889	
330711107171803	19610121	10.19				404	14S.04W.06.234B+DUP	33.119444	-107.2889	
330711107171803	19620102	11.49				404	14S.04W.06.234B+DUP	33.119444	-107.2889	
330711107171803	19630103	8.8				404	14S.04W.06.234B+DUP	33.119444	-107.2889	
330711107171803	19650105	0.65				404	14S.04W.06.234B+DUP	33.119444	-107.2889	

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Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330706107173701							14S.04W.06.300	33.119444	-107.2944	
330656107173701							14S.04W.06.300+DUP	33.116667	-107.2944	
330710107175002	19451004	-30.57				185	14S.04W.06.312A	33.119444	-107.2972	
330710107175002	19451218	-32.41				185	14S.04W.06.312A	33.119444	-107.2972	
330710107175002	19460525	-31.04				185	14S.04W.06.312A	33.119444	-107.2972	
330710107175002	19470122	-30.43				185	14S.04W.06.312A	33.119444	-107.2972	
330710107175002	19480124	-30.28				185	14S.04W.06.312A	33.119444	-107.2972	
330705107175001							14S.04W.06.313	33.119444	-107.2972	
330700107175302						381	14S.04W.06.313A	33.116667	-107.2981	
330705107174201	19560723	59.89				117	14S.04W.06.314	33.118056	-107.295	
330705107174201	19561004	47.5				117	14S.04W.06.314	33.118056	-107.295	
330710107173001							14S.04W.06.320	33.119444	-107.2917	
330716107172901	19460529	-40				442	14S.04W.06.321	33.121111	-107.2914	
330712107172701	19451017	-48				275	14S.04W.06.322	33.119444	-107.2903	
330710107173403	19590107	-15.89				442	14S.04W.06.322 A	33.119444	-107.2917	
330710107173403	19600105	-18.09				442	14S.04W.06.322 A	33.119444	-107.2917	
330710107174101	19750916	12				442	14S.04W.06.3221	33.119444	-107.2944	
330710107174101	19760210	10.18				442	14S.04W.06.3221	33.119444	-107.2944	
330710107174102	19760823	31.31				451	14S.04W.06.3221A	33.119444	-107.2944	
330710107174102	19770228	9.25				451	14S.04W.06.3221A	33.119444	-107.2944	
330710107174102	19780830	30.59				451	14S.04W.06.3221A	33.119444	-107.2944	
330710107174103	19750916	12				442	14S.04W.06.3221B	33.119444	-107.2944	
330710107174103	19760210	10.18				442	14S.04W.06.3221B	33.119444	-107.2944	
330710107174105	19760823	31.31				451	14S.04W.06.3221D	33.119444	-107.2944	
330710107174105	19770228	9.25				451	14S.04W.06.3221D	33.119444	-107.2944	
330710107174105	19780830	30.59				451	14S.04W.06.3221D	33.119444	-107.2944	
330712107172702						442	14S.04W.06.322A	33.12	-107.2908	
330710107173402	19590107	15.89				442	14S.04W.06.322A+DUP	33.119444	-107.2917	
330710107173402	19600105	18.09				442	14S.04W.06.322A+DUP	33.119444	-107.2917	
330700107174401	19630201	11.12				33	14S.04W.06.332	33.116667	-107.2956	
330700107174402	19630108	12				33	14S.04W.06.332A	33.116667	-107.2956	
330700107174403						15	14S.04W.06.332B	33.116667	-107.2956	
330700107174404						15	14S.04W.06.332C	33.116667	-107.2956	

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330700107174405						33	14S.04W.06.332D	33.116667	-107.2956	
330700107174406						35	14S.04W.06.332F	33.116667	-107.2956	
330650107175201							14S.04W.06.333	33.113889	-107.2978	
330652107174301						18	14S.04W.06.334	33.114444	-107.2953	
330652107174302							14S.04W.06.334A	33.114444	-107.2953	
330700107172301	19630218	13.51				17	14S.04W.06.342	33.116667	-107.2897	
330652107172501	19630105	11.5					14S.04W.06.344	33.114444	-107.2903	
330703107170701							14S.04W.06.400	33.116667	-107.2861	
330701107170502	19600811	18				31	14S.04W.06.400A	33.116944	-107.2847	
330716107171801	19590107	20.4				405	14S.04W.06.411	33.121111	-107.2883	
330710107173303	19590107	-20.54				410	14S.04W.06.411 A	33.119444	-107.2917	
330710107173303	19600105	-22.84				410	14S.04W.06.411 A	33.119444	-107.2917	
330710107173303	19610121	-21.19				410	14S.04W.06.411 A	33.119444	-107.2917	
330710107173303	19620102	-20.59				410	14S.04W.06.411 A	33.119444	-107.2917	
330710107173303	19630103	-20.42				410	14S.04W.06.411 A	33.119444	-107.2917	
330710107173303	19640204	-4.33				410	14S.04W.06.411 A	33.119444	-107.2917	
330710107173303	19650105	-4.73				410	14S.04W.06.411 A	33.119444	-107.2917	
330716107171802						285	14S.04W.06.411A	33.121111	-107.2883	
330705107171001						530	14S.04W.06.414	33.118056	-107.2861	
330655107171501	19600410	7				17	14S.04W.06.430	33.115278	-107.2875	
330655107171503	19600410	7				24	14S.04W.06.430B	33.115278	-107.2875	
330700107171701	19600410	7				21	14S.04W.06.431	33.116667	-107.2881	
330700107171702	19600410	7				24	14S.04W.06.431A	33.116667	-107.2881	
330700107170401	19590819	-0.5					14S.04W.06.441	33.116667	-107.2844	
330657107171701	19470122	58.3				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19470328	49.44				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19480124	57.9				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19490209	43.02				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19500123	31.22				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19510130	40.35				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19590107	24.49				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19600105	31.4				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19610121	29.39				302	14S.04W.06.441+DUP	33.116667	-107.2889	

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330657107171701	19620103	30.79				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19630103	30.9				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19640204	13.83				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19650105	11.99				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330657107171701	19660124	2.93				302	14S.04W.06.441+DUP	33.116667	-107.2889	
330700107170402	19580307	9.67				27	14S.04W.06.441A+DUP2	33.116667	-107.2844	
330700107170402	19670406	25.02				27	14S.04W.06.441A+DUP2	33.116667	-107.2844	
330657107171702	19470122	-58.3				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19470328	-49.44				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19480124	-57.9				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19490209	-43.02				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19500123	-31.22				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19510130	-40.35				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19590107	-24.49				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19600105	-31.4				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19610121	-29.39				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19620103	-30.79				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19630103	-30.9				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19640204	-13.83				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19650105	-11.99				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330657107171702	19660124	-2.93				302	14S.04W.06.441A+DUP3	33.116667	-107.2889	
330700107165601	19670406	26.73					14S.04W.06.442	33.116667	-107.2822	
330657107170302	19451017	-37.86				305	14S.04W.06.442A	33.116667	-107.2833	
330657107170302	19470122	-54.94				305	14S.04W.06.442A	33.116667	-107.2833	
330657107170302	19470328	-47.66				305	14S.04W.06.442A	33.116667	-107.2833	
330657107170302	19480124	-55.57				305	14S.04W.06.442A	33.116667	-107.2833	
330657107170302	19490209	-45.52				305	14S.04W.06.442A	33.116667	-107.2833	
330657107170302	19500123	-38.72				305	14S.04W.06.442A	33.116667	-107.2833	
330640107171101							14S.04W.07.214	33.111111	-107.2861	
330738107180201	19670321	65.77			Rio Grande		14S.05W.01.220	33.127222	-107.3006	
330733107180601	19460618	73			Rio Grande	95	14S.05W.01.223	33.125833	-107.3017	
330656107175801							14S.05W.01.444	33.116667	-107.3	
330652107175801						381	14S.05W.01.444+DUP	33.114444	-107.2994	

[a]Negative depth to water indicates water level above land surface datum

[b]Roybal (1991)

[c]Clark Summers (1971)

Summary of Well, Water Level, and Well Yield Data for
La Jencia and Rio Grande Basins in Study Area

Siteid	Water Level Date	Depth to Water[a]	Land Surface Elevation	Water Level Elevation (ft amsl)	USGS Basin	Well Depth (ft)	Well Location (NM Well Numbering System)	Well Location (decimal Lat Long) Latitude	Longitude	Reported or Estimated Yield (gpm)
330653107221901						55	14S.05W.05.434	33.114722	-107.3719	
330652107221001	19580307	15.4				185	14S.05W.05.443	33.114444	-107.3694	
330652107221001	19650716	13				185	14S.05W.05.443	33.114444	-107.3694	
330652107221001	19670207	12.87				185	14S.05W.05.443	33.114444	-107.3694	
330646107220601	19460619	18					14S.05W.08.222	33.112778	-107.3683	

[a]Negative depth to water indicates water level above land surface datum
[b]Roybal (1991)
[c]Clark Summers (1971)

Appendix C

Summary of Aquifer Test Results

Summary of Reported Aquifer Properties

Well Name	Location	Transmissivity (ft^2/day)	S	Method	Formation	Basin	Reference
Eagle-Picher Well	2S.1W.35.222	17,600	0.05	Step test	Santa Fe	Rio Grande	Schwab, 1980a
Socorro Industrial Park	3S.1W.23.123	8,820		Step test	Sante Fe	Rio Grande	Schwab et al, 1982a
National Guard Armory	3S.1W.23.233	472		Constant rate	Santa Fe	Rio Grande	Summers et al, 1981
		1,500		Recovery	Santa Fe	Rio Grande	Summers et al, 1981
Olson	3S.1W.2.423	30,000		Unknown	Santa Fe	Rio Grande	Summers et al, 1981
		28,000	0.235		Santa Fe	Rio Grande	Hantush, 1961
NMIMT Research	3S.1W.3.344	20,000		Unkown	Santa Fe	Rio Grande	Summers et al, 1981
City of Soccoro Well No. 1	3S.1W.14.234	<13,300		Constant rate	Santa Fe	Rio Grande	Summers, 1973
		16,000		Constant rate	Santa Fe	Rio Grande	Summers, 1973
Bushman	3S.1W.16.312	30,000		Step test and recovery	Santa Fe	Rio Grande	Summers and Schwab, 1983
Faulkner	1S.1W.35.142	9,200	0.0084	Unknown	Santa Fe	Rio Grande	Waldron, 1956
		8,000		Recovery	Santa Fe	Rio Grande	Waldron, 1956
		58,200	0.11	Unknown	Santa Fe	Rio Grande	Hantush,1961
Martin	1S.1W.34.233	3,700		Unknown	Santa Fe	Rio Grande	Waldron, 1956
Garner	2S.1W.13.184	26,300		Unknown	Santa Fe	Rio Grande	Waldron, 1956
Woods	3S.1W.1.121	15,400		Unknown	Santa Fe	Rio Grande	Waldron, 1956
unknown	unknown	7,000		Unknown	Santa Fe	Rio Grande	Theis, 1938
Test Hole #3	2S.4W.13.430	5,000		Constant rate	Volcanics[a]	La Jencia	Summers. 1975
unknown	unknown	160			Volcanics	La Jencia	Bishop, 1975

[a]Well intercepts fault zone. Transmissivity value likely not representative of formation as a whole.