

## APPENDIX A: COMMUNITY OUTREACH

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**RIO ARRIBA COUNTY  
AND  
RIO CHAMA ACEQUIA ASSOCIATION  
(RCAA)  
REGIONAL WATER PLAN**



**Regional Water Planning Workshop  
Onate Center, Alcalde, New Mexico 87511  
July 18, 1995**

**Workshop was conducted by:**

**Phillip Haseltine - New Mexico Interstate Stream Commission  
Aaron Rael - Western Network  
Lucy Moore - Western Network  
Lora Lucero, Attorney - Miller, Lucero, and Associates**

**People in attendance:**

**Josie E. Lujan , Chimayo  
Richard Lehmann, Ojo Caliente  
Patrick Vigil, Ojo Caliente  
Carlos Miera, Taos County  
Theresa Padilla, Taos  
Particio Garcia, Rio Arriba County  
Marylena Martinez, Rio Arriba County  
Beverly Armigo, Taos County  
John Gonzales, Taos County  
Fabi Romero, Taos County  
Jimmy Rodriguez, Espanola  
Vera Rodriguez, Espanola  
Jeff C. Vigil, Gallina  
Fidel Trujillo, San Juan Pueblo  
Palemon A. Martinez, NM ISC  
Bill Syre, RCAA  
Joe A. Mascarenas, Taos  
Vicente Martinez, Taos**

**Richard Lehmann, Ojo Caliente Ditch  
William L. Stevens, Arroyo Seco  
Tony A. Valdez, Co-op Ext. Service  
Hamilton Brown, Taos Valley Mutual  
Gilbert Salazar, Chamita  
Fred Waltz, RCAA  
Richard Pacheco, Western Network  
Orlando Santistevan, Rancho de Taos  
Kelly Fahey, La Jicarita Enterprise  
Ron Martinez, La Jicarita Enterprise  
Derrick Archuleta, Taos  
Tia Haynes, Carson  
Andulia Davis, Dulce  
Steve Harris, El Prado  
Julio O. Rodarte, Rodarte  
Darla Trujillo, Taos  
Casey Sanchez, Embudo  
Russell Naranjo, Rio Arriba County**

Estevan Arellano, Director, Oñate Center, gave a brief introduction:

Mr. Arellano believes that the acequias should not be preserved, instead we need more people to work their lands. During the 11th and 12th Century, people had the same problems as today. There was loss of water from the acequias when water was allowed to run into the neighbors. We need to get participation in the maintenance of our water resources and land. We need to educate our people on farming practices and how to irrigate their lands. A good method to achieve this would be by rotating the planting of crops at different times instead of all at once in order to extend the growing season (early and late crops). The problem is not so much the quantity of water, but learn how and when to use it. Our customs and traditions date back to the 1200's in which we have acquired our guidelines for sharing irrigations to promote a healthy society, good environment, and rich resources.

Phillip Haseltine - New Mexico Interstate Stream Commission spoke to the group:

The role of the Interstate Stream Commission is to administer water planning. The history of the Regional Water Plan came about from a lawsuit, when the city of El Paso wanted water from Dona Ana County. The Regional Water Plan needs to be used to build statewide water planning and must be somewhat consistent - Supply? Demand? Future?

In creating a plan the planner should focus on location, quality, water resource supply, and current water use. There should be a projection of future water quantity and use (40 year plan). A study must be made as to current water rights. During the process of creating a plan, there should be public input. Legislative funding is available in forms of grants or loans in aiding a regional water plan.

The workshop day consisted of various speakers and group discussion as outlined below:

- The three counties (Rio Arriba, Taos, and Mora) need to work together.
- More funding is needed from other sources.
- Coordinate with enterprise zone activity.
- Working on revising old plan.
- Public participation:
  - Design public involvement, carry out, and implement - interest groups, citizens, and outsiders (recreational).
  - Build on experience we have.
  - Suggestion made - have statewide open meetings, three (3) time a year and work with people in their communities, if possible door to door.
  - Educate, outreach, publicity (meetings), and field work (survey local people, questionnaires, and news letters), call-ins (toll free numbers, radio and television).
  - Need volunteer roles.
  - Field trips.
  - Utilize agencies such as the BLM, etc.

Have media forum with presentation phrasing.  
Be informed with necessary data.  
Have coordination and avoid duplicating, including traditional efforts.  
Include youth and schools.

**-History:**

1848 - Keary Code, honored rights to property.  
1848 -Treaty of Guadalupe Hidalgo, property rights of Mexican citizens shall be protected.  
Earliest water laws go back to Spain during 1250, developed to recognize native American presence, be more equitable.  
1924 Pueblo Lands Act to settle Pueblo land disputes  
Principle of local custom, water allocated by need.

**Closing:**

Overall group discussion on the daily outcome of the workshop. Some group members suggested that the group should meet after a two (2) month period to compare their progress in this area. The group was fully satisfied with the presentation of the workshop and its staff.

A detailed reported of the workshop will be mailed to members of the group by Western Network staff.

**RIO ARRIBA COUNTY  
AND  
RIO CHAMA ACEQUIA ASSOCIATION  
(RCAA)  
REGIONAL WATER PLAN**



**RCAA MEETING MINUTES**

**MEETING DATE:** October 23, 1995

**MEETING LOCATION:** Abiquiu Parish Hall, Abiquiu, New Mexico

Meeting was call to order by Fred Vigil at 1:10 P.M.

**ATTENDANCE:**

Fred Vigil, RCAA  
Gilbert A. Salazar, Chamita  
Randy Morfin, Youngsville  
Uvaldo Velasquez, Youngsville

Patricio Garcia, RA Planning & Zoning  
Felipe Martinez, El Rito  
Marylena Martinez, Secretary

**INTRODUCTION BY FRED VIGIL:**

Mr. Vigil welcomed all in attendance and gave a brief introduction as to the purpose of the organization. He emphasized the need for a plan to preserve both surface and ground water (acequias) in our area. There is a need for a forty (40) year Regional Water Plan in order to keep the supply of water and meet the demands in the study area.

**DISCUSSION:**

Mr. Vigil conducted a discussion and asked for input from the all in attendance. The following needs and ideas were presented:

1. Need for water systems
2. Community Centers - most areas do not have a community center, and lack a water system
3. Fire Stations (Sub-stations) - some areas already have a fire station, but lack a dependable water system and depend on water stored in truck tanks; the lack of a water supply system is the cause of high insurance rates for home owner.

4. Acequias for use in:
  - a. Agriculture
  - b. Livestock
5. Waste Water Systems in rural communities
6. Water use for commercial - industry
  - a. Tree farms
  - b. Sod farms
  - c. Agriculture
  - d. Livestock
  - e. Education
  - f. Recreational planning
7. Historical use - Multi-use - storage of water and priority in use of water
  - a. Domestic
  - b. Livestock
  - c. Agriculture
  - d. Commercial
  - e. Subdivision
8. Water source protection - custom/tradition

Uvaldo Velasquez expressed concern of too many partials (subdivisions) being established in his area and fears the invasion into his land. He is also concerned about the water supply that is being used by industry in his area. We must be educated on what land is owned by the State and Federal Government, who owns the water rights and who can use the water.

Gilbert Salazar expressed the need for the creation of an association to support united community effort.

Patricio Garcia informed the group of Ordinance 1996-01 (Subdivision/Regulations)- zoning to protect the life style. We must concentrate on land development in terms of the effect that it might have on our lives and our children's lives. The question is, what will be available for our children in the future as to land and housing? A solution to this is affordable housing for low income families. Public housing might be a problem (drugs, fighting, etc.). Industry in our area - the public must be involved (solid waste, water, and other aspects). We must be concerned with the contamination to our water systems, it is difficult to clean. There is concern with fire departments being able to accommodate the enlargement of our residential areas. Mr. Garcia informed the group of the public meetings that are being held by the Planning and Zoning Department and invited them to attend.

Randy Morfin is concerned with the water rights and irrigation that are given for a certain period of time to the residents in Youngsville. Water is only available to the residents during a certain period and if water is still available after this time, residents are not allowed to use the water. He was advised to bring the matter to the Water Association.

Felipe Martinez asked what the goals of this group are?

Fred Vigil informed that group that monies (\$23,000.00/Inter State Stream Commission) have been proposed through Rio Arriba County to get community involvement. We are in Phase II, quality and quantity of water, working towards creating a forty (40) year plan for a water system. A group of people will work together, forming a Citizens Advisory Committee. By next summer a report will be completed, identifying what is needed in the communities as far as water use (growth for education, business, residential, etc.).

In closing Mr. Vigil asked the group to visit their neighbors and inform themselves as to what the needs are for their community.

**NEXT MEETING IS SCHEDULED FOR MONDAY, NOVEMBER 20, 1995, 6:00 P.M., AT THE GHOST RANCH LIBRARY, ON THE WEST SIDE OF THE CAFETERIA, ABIQUIU, NEW MEXICO.**

**MEETING ADJOURNED AT 2:45 P.M.**

**RIO ARRIBA COUNTY  
AND  
RIO CHAMA ACEQUIA ASSOCIATION  
(RCAA)  
REGIONAL WATER PLAN**



**RCAA MEETING MINUTES**

**MEETING DATE:** November 20, 1995

**MEETING LOCATION:** Ghost Ranch, Abiquiu, New Mexico

Meeting was call to order by Fred Vigil at 6.50 P.M.

**ATTENDANCE:**

Fred Vigil, RCAA,  
Karl Bode, Abiquiu  
Andulia Davis, Dulce

Patricio Garcia, RA Planning & Zoning  
Marylena Martinez, Secretary  
Aubrey Owen, Abiquiu

**INTRODUCTION BY FRED VIGIL:**

Mr. Vigil welcomed all in attendance and gave a brief introduction as to the purpose of the organization. He briefed the group as what has transpired in the previous meetings and emphasized the need for a forty (40) year Regional Water Plan. There is great need in preserving the supply of water (surface and ground - acequias) to meet the demands in our area. The organization has been financially funded through Interstate Stream Commission Grant, with Rio Arriba County acting as its fiscal agent. Mr. Vigil also stated the importance of Regional Water Planning from the local communities perspective. Its important that local residents involve themselves in this type of planning.

**DISCUSSION:**

Mr. Vigil conducted a discussion and asked for input from the all in attendance.

A brief review of needs and ideas were discussed.

1. Domestic Use
2. Fire Stations (Sub-stations)



3. Community Centers and Senior Citizen Center
4. Agriculture and Livestock
5. Commercial and Industry (Education, Tree Farms, Sod Farms, Agriculture, Livestock, and Recreational)
6. Economic Development
7. Forestry and Landscaping
8. Waste Water Systems in Rural Communities
9. Storage of Water and its Beneficial Use
10. Storage Rights
11. Acquiring Additional Water Rights
12. Seek Out Unappropriated Water and Apply For It
13. Acquire Water Storage Rights at Abiquiu, El Vado and Heron Dam, If Possible

With a forty (40) year Regional Water Plan, we can start utilizing our water sources by planting trees for forestry and possibly employing young kids to plant trees and other vegetation. We can also plant fish in our rivers and participate in its life to show that we own a share an interest in the river water.

Andulia Davis shared some literature that she obtained while attending the Statewide Conference on Water Conservation. She talked briefly about the Apache Tribe at Dulce. The growing season in Dulce is shorter. They plant trees (mostly pine) along the reservation area.

Aubrey Owen suggested a study be done to find out how much surface and underground water is available. It is important that this water does not go outside our area. There is a great demand for a community water system (domestic use). The sewer systems are polluting our water.

Karl Bode expressed the great need for domestic water use in the Abiquiu area.

Fred Vigil is concerned with the dumping of sewer waste. We need to develop a place that will handle the sewer waste from sewage trucks. We need to plan on constructing a retirement home, so that our people stay in our area.

Patricio Garcia is concerned with the pollution in our water. He agrees that we need to develop a dumping place for sewer waste. It is illegal to dump in your own pasture. EID allows close vault systems, but there is still the problem as to where to dump the waste (gray water sewer). Santa Fe, Lindrith, and Pojoaque are presently constructing a three (3) way waste water system, they are the only solid waste facilities in the area.

**Brief discussion:** The State of New Mexico owes water to the State of Texas. New Mexico has offered to pay money to Texas for the use of water, but Texas does not want any money. The State of Texas wants payment in water rights. Matters dealing with the Pecos compact. We need to learn more about what water is available on the Chama Basin.

Aubrey Owen request information from State that will tell us what amounts of water exist in the Aquafer, etc.

The main discussion of this meeting focused on the present problems with our water supply and how to preserve our water. The main concern with the people in attendance is the quantity and quality of our water system. Everyone is in agreement that we need to develop a good water and waste systems that will benefit our communities and make a safe environment for its citizens. The goals of this organization will be to create a plan that will save our water sources that will supply the growing communities in domestic use, industrial use, and overall use.

In closing Mr. Vigil asked the group to visit their neighbors to attend our next meeting and bring their ideas as to how to help our communities. A suggestion was made that we might invite people to attend the meetings on a more personal basis, such as, calling individuals by phone.

**NEXT MEETING IS SCHEDULED FOR FRIDAY, JANUARY 12, 1996, 1:00 P.M., IN THE EL RITO AREA. (LOCATION TO BE ANNOUNCED AT A LATER DATE) IF NO AVAILABLE LOCATION IN THE EL RITO AREA IS POSSIBLE, A DIFFERENT LOCATION WILL BE ANNOUNCED LATER.**

**MEETING ADJOURNED AT 8:15 P.M.**

**RIO ARRIBA COUNTY  
AND  
RIO CHAMA ACEQUIA ASSOCIATION  
(RCAA)  
REGIONAL WATER PLAN**



**RCAA MEETING MINUTES**

**MEETING DATE:** January 12, 1996

**MEETING LOCATION:** Abiquiu Parish Hall

Meeting was call to order by Fred Vigil at 1:00 P.M.

**ATTENDANCE:**

Fred Vigil, RCAA

Dick Lehmann, Ojo Caliente

Patrick A. Vigil, Ojo Caliente

Uvaldo Velasquez, Coyote

Randy Morfin, Coyote

Karl Bode, Abiquiu

Fidel Trujillo, Chamita

Frank Chacon, Gallina

Agustin R. Garcia, Abiquiu

Aubrey Owen, Abiquiu

Marylena Martinez, Secretary

**I. Fred Vigil - Regrets from Patricio Garcia, Director, Rio Arriba County:**

Fred Vigil expressed regrets from Patricio Garcia for not being able to attend the meeting. Mr. Garcia had a previous engagement.

**II. Introductions: (Fred Vigil)**

Mr. Vigil welcomed all in attendance and gave a brief introduction as to the purpose of the organization. He briefed the group as what has transpired in the previous meetings. He emphasized the importance of working together to preserve our water supply for our citizens and communities. Unity of local communities in working with the Regional Water Planning is of great importance in creating a forty (4) year plan to maintain our water supply. Mr. Vigil asked all in attendance to introduce themselves.

**III. Background on Regional Planning:**

The City of El Paso has asked the United States Supreme Court to rule on the

transferring of water from one state to another. The United States Supreme Court ruled that this was legal. The legislature has set up and provided funding through the Interstate Stream Commission, with Rio Arriba County acting as its fiscal agent, for the Rio Chama Acequia Association to implement a forty (40) year Regional Plan. The key is projection of water for each region.

- IV. Presentation from Community Members expressing their needs for their respected communities; and General Discussions:

**DISCUSSION:**

Fred Vigil read a list of water needs for the El Rito area that was presented to him by Felipe Martinez. The list of needs are as follows:

- a. Expansion of Northern New Mexico Community College
- b. Clinic
- c. Business/Commerce
- d. Growth of Public Schools
- e. Arts/Studios
- f. Fire Station
- g. Agriculture
- h. Mutual Domestic (expansion/growth)
- i. Storage of Water
- j. Land Grant
- k. Sewage Treatment Plan
- l. Recreational/Swimming Pool

Randy Morfin, Coyote: There is a need to develop a source for water for National Guard use, because they are presently hauling water to the community of Youngsville. The agricultural needs in his area are important, as well as for domestic use.

Patrick Vigil, Ojo Caliente: Mr. Vigil asked if there was money available for disaster relief and grant money available to help communities for sanitation. There is a need for clean water supply for the fire department, agricultural, schools, and a need for a storage facility. We need to develop a place to recycle waste. Taos Junction was suggestion as a good location to recycle waste. We are interested in growing grapes and building a winery. Agricultural will be a major part. We should plan tree farms and make use of forest products. There is a great demand for water, mature trees need about fifty (50) gallons of water a day. We need to get more involved with the US Forest Service on how to use this products. A meeting will be held with the State Legislature on February 10, 1996, to educate people on the use of the forest for the lively hood of the people. We should work on growing food to trade or sell in order to bring a strong economy back into the community. These

items should be addressed due to the growth in the area. There is also community interest in developing a fish hatchery.

**Dick Lehmann, Ojo Caliente:** There is more demand for use of our ditches. He is interested on what the County is doing in developing sewage systems. There is a danger of contamination of our well water supply. A waste water treatment is needed. We need to promote the use of the water and land in our area and protect our agriculture. Mr. Lehmann agrees that we need to work on building our economy for profit. Plan a reasonable projection from the available information on growth as to how the use of water has occurred in the past twenty (20) years and plan thereafter.

**Fidel Trujillo, Chamita:** We are planning a waste water treatment in the Chamita area. They have been working with San Juan Pueblo in this matter. A study should be made in this area. Our needs are the same as other communities. We need to increase the participation of people in this association.

**Agustin Garcia, Abiquiu:** Abiquiu Creek would be a good water source for Abiquiu. The Canyon would serve as a good fishing area and recreation facility for the Village of Abiquiu.

**Frank Chacon, Gallina:** The Gallina area has the same water supply needs as other areas that have been discussed in this organization. We must prepare for the future by protecting our water quality and quantity both for agricultural and other areas in our community. We must maintain control of our water in regards to outside people coming in and planning development without local communities consent.

**Aubrey Owen, Abiquiu:** We must plan for the use of our water for this area or it will be exported. We are in a growing area that is in need of water for domestic, recreational, and agricultural use. In addition there is a great demand for water in housing development and industrial use.

**Uvaldo Velasquez, Coyote:** Mr. Velasquez is interested in protecting our under water supply. He is worried about the land partials getting all the water (Developers). He is also concerned with the increasing housing development using all the water. He will contact other individuals to attend Planning Meeting.

#### V. Outreach and Recruitment:

Fred Vigil read the names of people on the mailing list. Additional names were added to the mailing list. People will be invited to participate on the next meeting by personal contact. Mailings will be set out to invite and increase the participation in the organization. Flyers have also been suggested as a way of informing the

public of the organization.

**VI. Planning for Next Meeting Date:**

Next meeting is scheduled for Friday, February 9, 1996, 1:00 P.M., at the Abiquiu Parish Hall, Abiquiu, New Mexico.

**VII. Adjournment:**

Meeting adjourned at 2:30 P.M.

**RIO ARRIBA COUNTY  
AND  
RIO CHAMA ACEQUIA ASSOCIATION  
(RCAA)  
REGIONAL WATER PLAN**



**RCAA MEETING MINUTES**

**MEETING DATE:** February 9, 1996

**MEETING LOCATION:** Abiquiu Parish Hall

Meeting was call to order by Fred Vigil at 1:15 P.M.

**ATTENDANCE:**

Fred Vigil, RCAA

Dick Lehmann, Ojo Caliente

Leo Salazar, Coyote

Uvaldo Velasquez, Coyote

Agustin R. Garcia, Abiquiu

Aubrey Owen, Abiquiu

Marylena Martinez, Secretary

Salomon Lovato, Coyote

**I. Introduction of Members and Guest:**

Fred Vigil introduced himself. Mr. Vigil welcomed all in attendance and gave a brief introduction as to the purpose of the organization and the importance of preserve our supply. Persons in attendance introduced themselves and the communities they represented. Additional names were added to the mailing list.

**II. Presentation and Concerns from Community Members:**

**GENERAL DISCUSSION:**

Mr. Vigil: We must work on a plan to preserve our water and where to go in the next forty (40) years. Some of the are of the community needs for water are: fire station, agriculture, business/commerce, schools, storage of water, recreational, storage of flood waters, and mutual domestic use. We need to store our water in tanks for the time when there is a need for it. Mr. Vigil asked community members to speak on the needs for their community.

Salomon Lovato: There is a great need for water for washing and drinking. Lots are being sold and there is a great deal of development being constructed. This is heading

towards creating a big city soon. There is concern on just a certain amount of over flow water that can be stored. There is a need for repairing our ditches and acequias so that we can maintain our water source.

Leo Salazar: Water use for agricultural is primary. We need to expand and improve our water source for ourselves and our children. We must store our over flow of water. Create a forty (40) year plan. It is important that water rights and agricultural work together.

Dick Lehmann: A suit in the Abiquiu area, Craftsman can keep the water from the river, only water on the water table. We must maintain our water for agricultural use. It is important that get people to understand their water rights and to tie the water rights to the lands. It is also important to keep the water rights and keep from sell this rights. Your water rights are only yours if you use them. By not using the water right, might be cause for this rights to be taken away. Acequias should have the first rights and only sell to another association.

Agustin Garcia: Control the water expansion in housing.

Fred Vigil: The use of a ditch liners to control seepage that conserves the water that flows for irrigation is a good system. This method is good for community use.

Uvaldo Velasquez: Mr. Velasquez agrees that the ditch liners work good.

Leo Salazar: Mr. Salazar is interested in obtaining emergency money to repair ditches. Mr. Salazar plans to go with the Corp of Engineers to help with repairs.

Fred Vigil: Loans can be obtained from the Interstate Stream Commission at 2 1/2% interest.

Dick Lehmann: Money is available if you ask. There some organizations that may have money available.

### III. Outreach and Speakers (Dely Alcantara, UNM Bureau of Business and Economic Research):

Ms. Dely Alcantara, UNM Bureau of Business and Economic Research, is a demographer. She conducts studies on population growth. Mr. Vigil is interested in inviting Ms. Alcantara to attend and speak at our next meeting.

Uvaldo Velasquez: There will be a meeting with Jicarita on February 13, 1996 in Gallina. The Apaches are trying to take our water. They are trying to sell the water rights.



**Fred Vigil: Jicarita claim their water rights out of the Rutherford Ditch, West of the Continental Divide.**

**Aubrey Owen: Rio Arriba County needs to have control on growth.**

**In closing Mr. Vigil encouraged community members to inform their neighbors and community members to attend our meetings.**

**IV. Planning for Next Meeting Date:**

**Date, time, and place of next meeting will be announced at a later date. Mailings will be sent out along with the information of next meeting.**

**V. Adjournment:**

**Meeting adjourned at 2:30 P.M.**

### A18. Overview summary of survey procedures and responses

Survey forms were sent to Rio Chama Acequia Commissioners, U.S. Forest Service Rangers, Fire Chiefs, Mutual Domestic operators, and County Commissioners, respectively. The surveys asked participants to identify water uses, needs, and projected water needs for their respective communities and service areas. This information provided an overview of issues and concerns about water use and water availability and helped in the development of a Regional Water Plan that addresses the concerns of the inclusive population. The following table summarizes the relative numbers of responses from each group.

Date survey sent	Survey audience	Surveys sent	Surveys recieved	Percent response
December 12, 1996	Acequia Commissioners	68	17	25.0 %
January 13, 1997	Forest Service Rangers	3	2	66.6 %
January 27, 1997	Fire Department Chiefs	12	7	58.0 %
January 29, 1997	Mutual Domestic Operators	57	11	19.0 %
January 30, 1997	County Commissioners	2	0	0.0 %

The Rio Chama Acequia Commissioners were contacted through a mailing list provided by the Rio Chama Acequia Association (RCAA). In general, the Acequia Commissioners are concerned about the preservation of their land and water rights and their agricultural lifestyle. They are concerned about the growing population and the lack of a planning process for developments that will accommodate the influx of people (i.e. infrastructure and services required for a greater population). They are concerned about the ecological integrity and management of their environment with respect to erosion, wildlife habitat, water quality, water availability, and their access to resources. They would like to have greater representation in policy and decision making. See pages A23-A28 for specific information concerning Acequia Commissioners' responses. The mailing list of the Acequia Commissioners is provided in Table A29.

The U.S. Forest Service was contacted to obtain a list of District headquarters within the Rio Chama basin. The Rangers of each of the three Districts (El Rito, Canjilon, and Coyote) in two National Forests (Carson and Santa Fe) were mailed for information pertaining to the water uses and projected water needs of their Forest Service facilities and districts. Two responding Forest Rangers (John Miera, Santa Fe National Forest, Coyote District and Kurt Winchester, Carson National Forest, El Rito District) outlined present and projected water needs for their districts. In summary, the Coyote District foresees the potential doubling of Forest Service facilities in the next 40 years with large expansions of irrigated lands. The El Rito District is undergoing expansion of Forest Service buildings as is looking to increase irrigated pasture for horses. See page A33 for a more detailed summary of the responding Forest Service Rangers. The mailing list of all the Forest Service Districts and Rangers is provided in Table A33.

A list of Fire Departments of Rio Arriba County was obtained from the County of Rio Arriba Fire Marshall. The Fire Chiefs of the various Fire Departments within the Rio Chama basin were sent surveys pertaining to service area, water supply, water uses, and projected water needs for fire protection in their respective areas. In summary of the

responding Fire Chiefs, there is concern about a growing population and the need to develop water resources to accommodate their inflow with respect to fire protection needs. Various other needs included hydrants, wells, pumps, the requirement of water rights, and a substation. See page A36 for a summary of responses from the Fire Chiefs. The mailing list of all the Fire Departments and Chiefs in the Rio Chama basin is provided in Table A38.

A list of Mutual Domestic and other public and private water systems for Rio Arriba County was obtained from the State of New Mexico Environment Department, Drinking Water and Community Services Bureau. Water System operators within the Rio Chama basin were contacted with surveys pertaining to the service area and population, water use, water quantity and quality, and predicted need for expansion of water serving facilities in the future. Water system operators foresee a need to increase services due to the growing population. There was also indicated a concern for water quality and quantity. See page A41 for a summary of responses from Water System operators. A mailing list of Water Systems for the Rio Chama basin is provided in Table A44.

✦ On the following pages are copies of the cover letters, surveys, and survey summaries, quotes, and mailing lists of the respective survey audiences.

## M E M O R A N D U M

DATE: December 12, 1996

TO: Rio Chama Regional Water  
Plan Advisory Committee/  
Acequia Commissioners

FROM: Fred Vigil *Fred*  
753-4519

RE: Survey form regarding  
current and projected  
water use

CC: File

Please review the enclosed general outline of current and projected water uses. Add, delete, or modify this outline in a manner that best explains the conditions concerning the water use of your area for the present and the future (~40 years). Also, please use this information and any other ideas you may have to complete the included survey form and return by January 5, 1997 to:

Rio de Chama Regional Water Plan  
PO Box 687  
Medanales, NM 87548

The information obtained from this survey will be compiled and will contribute to The Regional Water Plan for the Rio Chama Basin. This Water Plan is crucial toward understanding the use of our most precious resource by our communities and toward the development of a water conservation plan to benefit the people of the Rio Chama Basin. If you have any questions, concerns, or comments, please do not hesitate to call.

### Survey form

Please check all current water needs that apply to you and your family. Explain your water needs in appropriate areas and add any other uses of water that you can think of on the blanks at bottom of the page.

Community:

Contact person:

#### Current water needs

Agriculture

- Irrigation and Acequias (~ acreage?)
- Livestock (types, numbers, ~ acreage?)

Domestic

- Home use (number in household?, pets?)
- Do you have your own well? Is it metered?
- Is there a mutual domestic water system in your community? If yes, name:

**Please check off the following uses of water if they apply to your community.**

Churches (how many in area?) \_\_\_\_\_

Stores (convenience, gas stations, etc.) \_\_\_\_\_

Restaurants (how many?) \_\_\_\_\_

Medical clinics \_\_\_\_\_

Schools (what types, how many?) \_\_\_\_\_

Federal, State, County, or City complexes (for example, The US Forest Service)

Library \_\_\_\_\_

Recreational facilities (for example, campgrounds, parks, swimming pools, etc)

Other uses of water in your community \_\_\_\_\_

Comments, suggestions, and/or criticisms \_\_\_\_\_

\_\_\_\_\_

Please expand upon the previous page and list (brainstorm) potential uses of water ~ 40 years from now. Some examples are provided, please elaborate.

**Projected water needs (~ 40 years from present)**

Agricultural water estimate (expansion of agricultural lands, expansion of livestock grazing areas, water banking (storage), orchards, etc.)

Do you predict the population to grow in your area?

▪ Explain: \_\_\_\_\_

▪ If yes, please explain what kinds of services will be needed.  
(for example: schools, churches, stores, etc.)

\_\_\_\_\_

Do you foresee any other developments in your area?

▪ Explain: \_\_\_\_\_

Do you predict a need for more or better recreational facilities?  
(for example: parks, campgrounds, fishing areas, etc)

Do you have any environmental/ecological concerns about your area? Please explain or circle those applicable.  
(for example: loss of grazing lands on public lands, degradation of forested and riparian areas, erosion problems, loss of wildlife or game animals, etc)

Do you foresee any other water issues or needs that will need to be addressed in the future? Please explain.

☞ List what areas you would like to see further involvement by county government.

## A23. Synopsis of individual responding Acequia Commissioners

### 1) Abiquiu -

Agriculture - 60 acres

Water infrastructure - Have own well for 5 people that is not metered, also mutual domestic (Abiquiu Water Association)

Projections/concerns - Predict a need for leasing of water right from accumulated bank. Concerned about land being subdivided and sold. Foresees the need of domestic wells and building materials to accommodate population growth. Foresees the developments of small home businesses. Is concerned about recreational facilities that accommodate outsiders rather than locals. Concerned about trash and traffic pollution created by some of the local businesses. An important issue of the future is the selling of water rights.

### 2) Agustin R. Garcia, Abiquiu

Agriculture - approximately 185 acres with approximately 300 livestock

Water infrastructure - 130 households, Abiquiu Domestic

Facilities - 3 churches, parish hall, rectory, 2 stores, 3 restaurants, 2 bars, 1 medical clinic, public school, head start, post office, library, gym, baseball field, motel, Georgia O'Keefe Foundation

"More water use due to expansion of population. Future recreational facilities - i.e. swimming pool, park, etc."

Projections/concerns - "Expand on agricultural water use, and expansion of livestock as the need arises."

Predicts population to grow "extremely - due to exposure of area." Schools, churches, stores, etc., will be necessary to accommodate growth as need arises. Predicts a need for more or better recreational facilities. Loss of grazing lands on public lands, degradation of forested and riparian areas, erosion problems, loss of wildlife or game animals, etc., "will become concerns and eventual problems." Foresees more decision making as needing to be addressed in the future. Would like to see the county more involved in zoning and maintaining the traditional lifestyles of local natives.

### 3) Juan D. Lopez, Abiquiu -

Some agriculture and livestock

Has own well in addition to a mutual domestic water system

### 4) Arthur R. Trujillo, Angustura

Projections/concerns - Foresees a need for a water banking program. Observing population increase.

### 5) Alfonso Martinez, Barranco -

Agriculture - 110 +/- acres with 200 +/- cattle and horses

Water infrastructure - mutual domestic (Barranco Domestic) serves 25 houses (~4 per home)

Water used for gardens and orchards

Projections/concerns - agricultural expansion. New homes being built indicate growing population

### 6) Ernesto Archuleta, Cebolla -

Agriculture - 5 acres with cattle, sheep, goats, and horses

Water infrastructure - Own well for irrigation and for farm animals (not metered). Cebolla Mutual Domestic Water Association for 4 people in household.

Facilities - 1 church; 2 stores (predict 2 to 5 in next 40 yrs); no restaurants (predict 2 or 3 in next 40 yrs); estimate 1 medical clinic in next 40 yrs; County complex; estimate one campground, etc., next 40 yrs; Fire Dept.; Cebolla Livestock Association.

Projections/concerns - "What we need in Cebolla is a dam to hold the spring runoff to help the community in mid-summer with water shortages." Estimates community to grow by a factor of 4, will need stores, restaurants, churches, bigger Fire Dept., car wash, etc. Foresees developments in agriculture, maybe poultry farm, and orchards. Presently working on a park from land that belongs to Forest Service. With a dam they could have better fishing areas. Have a concern with wildlife but think building a dam will help, especially during drought. Would like to see further county involvement in the creation of a water budget, and to have the public more involved in decision making concerning water. Also would like to see county officials try to get more dams built in community to benefit local ranchers.

## 7) Juan Archuleta, Chamita

Agriculture - Acequia de Chamita ~480 acres, San Juan Pueblo ~240 acres; with livestock

Water infrastructure - ~300 households, some with own well and mutual domestic system

Facilities - San Pedro church, Chamita Morada, 2 stores, 1 gas station, 1 kindergarden, community complexes, play ground, swimming pool, fire department

"Chamita community growing at a fast pace"

Projections/concerns - Predict an increase in gardens, orchards, and livestock. Predicts population growth that will require stores, gas stations, churches, schools, and recreation facilities (camp grounds, play grounds, and swimming pools). Concerned about erosion by the Chama River and arroyos flowing into acequias. Forsees a need for a community sewage system. Improvements to acequias...piped or lined.

## 8) Frank A. Archuleta, Chili -

Agriculture - 5 acres in clover cover crop, orchard, variety of fruit trees; no livestock

Water infrastructure - Own well (not metered) for 4 people, 5 dogs; no mutual domestic system, however, the formation of the Agua Sana Assoc. may bring a mutual domestic in 1998.

Water uses/issues - 1 morada; some landowners use river water for their needs from a storage tank on a trailer.

Projections/concerns - Agricultural expansion by new orchards, vineyards, grazing, cover crops, grain crops, water banking and storage. Prediction of large population growth in northern New Mexico due to industry and climate. This population growth will require services such as schools, churches, and stores. There is a need for parks and fishing areas. Experienced loss of grazing on public lands, degradation of forested areas and stream banks, erosion problems, loss of wildlife and game animals. Because of this, planning will be very important with county, state, and federal govt. Water issues that need to be addressed are the water rights for small agricultural farmers and their survival, and the water needs of Alb. and Santa Fe in relation to water conservation in our areas. Further involvement by county government is needed in the areas of zoning, agriculture, and the environment.

## 9) Elmer Maestas, Chili

Agriculture - 13.5 acres

Water infrastructure - own well for 4 people, not metered, no mutual domestic

Facilities - 1 chapel

Projections/concerns - importance of fishing. Population growth expected based on additional homes. Growth will require a fire department. Forsee developments of service station and grocery store. Concerned about erosion problems.

## 10) Barbara &amp; Dick Lehmann, Ojo Caliente -

Agriculture - 9.2 acres

Water infrastructure - own well for 2 people that is not metered. Also Ojo Caliente Mutual Domestic Water Consumer's Coop Assoc.

Facilities - 1 church, 2 stores, 3 restaurants, 1 medical clinic, 1 school, Highway Dept Maintenance Yard, and 2 recreational facilities.

Projections/concerns - More active use of land for agriculture and livestock. Predict the population to grow, will require all infrastructure. Forsee small, soft manufacturing, and industry in area. Predict a need for all infrastructure as population grows..."natural migration area." Also predict a need for recreational facilities of all kinds to accomodate growing population. Too much free or low cost use of resources available on public lands. Enforcement of current laws regarding water use and distribution. There is wide spread illegal water use from rivers and wells.

## 11) Patrick Vigil, Ojo Caliente -

Agriculture - 200 acres in 1 of 5 acequias with numerous livestock

Water infrastructure - own well for 4 people and 2 pets but not metered. Also Ojo Caliente Domestic Water Users Assoc.

Facilities - 3 churches, 5 stores, 5 restaurants, 1 medical clinics, 2 schools, Fire Dept, Road Const.

Projections/concerns - "With all the money thrown at this problem thus far, all studies, questionnaires, and statistical data, is behind the times in my opinion." "Since expansion has occured on agricultural land - development will displace water usage when more agricultural land is needed." Prediction of population growth with eventual water shortages - water will need to be shipped to areas with out any. Environmental/ecological concerns include a loss of common lands surrounding land grants. "Water is a not-so-renewable resource under all present leadership."



## 12) Roy-El Morgan Farm, Rio Chama -

Agriculture - 48 acres with up to 70 grazing cattle

Water infrastructure - Used to have own well

Facilities - Abiquiu grade school

Projections/concerns - "My area is all agriculture, pasture, alfalfa. We need the water desperately. Our system needs to make sure we supply adequately what we need now and try to foresee uses in the future." Would like to double alfalfa production to 50 acres. Predicts population growth - residential with gardens and fruit trees. May want to put a home on own property. Need for recreational site. Concerned about loss of grazing on public lands, degradation of riparian areas, and erosion problems. "There will always be needs that we haven't thought of and therefore a reserve [of water] should be put aside for such growth."

## 13) Henry Ulilani, Tierra Amarilla -

Facilities - 1 church, 3 stores, 1 restaurant, 2 medical clinics, 1 ea. elementary, middle, and high schools, New Mexico Hwy Dept., County Courthouse, 1 bank

Projections/concerns - water storage for all uses. Population growth will require a sewage system. There is a need for more or better recreational facilities. County involvement is needed in the northern part of Rio Arriba County for the improvements and maintenance of highways, roads, rivers, and ditches.

## 14) James and Dolores Backey, Tierra Azul

Agriculture - 6 acres with 1 cow and 20 chickens

Water infrastructure - own well for 3 people and a dog that is not metered, no mutual domestic.

Facilities - 1 church in Medanales, 1 in Abiquiu; Bobs - Bode's stores, 1 elementary

Projections/concerns - Need water for fishing in the Rio Chama

## 15) Garfield J. Gutierrez

Agriculture - 3 acres irrigated from Los Salazar's

Water infrastructure - have own well for 2 people that is not metered

"Central water system is needed for the entire valley and water disposal system is also needed."

Projections/concerns - "Water usage for agriculture, livestock, and grazing may remain pretty much as is. Population growth certainly a factor to consider in projecting future water needs. The more people the more services will be needed. Housing and business expansion will be a major factor to consider for use of existing water. Before recreation areas are considered one must take into the planning water needs of these projects. Overall planning is needed by communities, county, regional, and state. County involvement is not sufficient because the problem is a northern New Mexico head ache." Concerned about water wells, septic tanks, surface water pollution, sewage disposal methods that pose danger to existing fresh water.

## 16) Abel Herrera, J.V. Martinez Ditch -

Agriculture - 140 acres, 150 livestock

Water infrastructure - own wells for 15 homes (4 ea. household) but no meters and no mutual domestic.

Water uses/issues - church needs water

## 17) Henry C. Salazar -

Agriculture - 12 acres, no livestock

Water infrastructure - Own well for 2 people, no mutual domestic water system

Projections/concerns - People are moving out of big cities into our less congested areas. This growth will require all services related to peoples needs. Future growth includes industry in the industrial park. Environmental/ecological concerns include loss of agricultural land to housing development, contamination of water supply and depletion of aquifer. Future water issues include the need for a sewer system for the Rio Chama, Espanola areas (semi-populated areas).

## A26. Rio Chama Acequia Commissioners' Survey Summary

On December 12, 1996 survey forms were sent out to 68 Acequia Commissioners in the Rio de Chama drainage basin concerning water uses and projected water needs in their areas. The surveys asked the commissioners to identify water uses in their areas with respect to the amount (acreage) of agriculture, numbers of livestock, extent of household use, and numbers and types of services and facilities in their communities as well as predictions and concerns of water needs and issues in the future. Seventeen responders from Abiquiu, Angustura, Barranco, Cebolla, Chamita, Chili, Ojo Caliente, Rio Chama, Tierra Amarilla, and Tierra Azul, among others, identified their concerns for themselves as individuals, as heads of household, or as members of acequias. This information provided an overview of issues and concerns of community members and will help gear the Regional Water Plan for the Rio Chama drainage basin toward the needs of its population.

Agriculture is historically one of the most significant uses of water in the Rio Chama drainage basin and the acequia systems continue to be of vital importance to the economic, social, and cultural livelihood of the area. Respondents' agricultural uses of water ranged from several acres in orchards, gardens, and cover crops with some cattle, sheep, goats, horses, and chickens for individuals and families, to hundreds of acres of alfalfa for hundreds of cattle and horses for the acequias. Seven respondents expressed a desire for agricultural expansion and more active use of land for agriculture, orchards, poultry, and livestock.

Twelve of the seventeen respondents have their own well to provide for domestic water use, irrigation, or farm animals but none of these wells were metered. Eight respondents indicated they were using a mutual domestic water system, five in addition to their own wells. One from Chili indicated a plan for a mutual domestic system by 1998. Other (County) sources indicate the communities of Gallina and Vallecitos are in the process of developing a mutual domestic system to serve their communities. Numbers of people in household ranged from 2 to 5 people with 1 to 5 pets (dogs).

Depending on the respondents' location, there was variation in the kinds and numbers of services and facilities including churches, stores, gas stations, fire departments, restaurants, bars, medical clinics, schools, motels, etc. There was also recreational facilities such as gymnasiums and baseball fields. See survey responses in Appendix D for more detailed information.

Ten respondents indicated a concern for the impact of population growth in the Rio Chama basin with respect to the loss of water rights, the lack of planning and infrastructure to accommodate growth, and the subdivision and sale of land. All of these respondents pointed out that population growth in the Rio Chama area will require an increase in all services related to people's needs. Eight indicated a need for more and/or better parks, recreation areas, and fishing areas for the current population and to accommodate future population growth. One pointed out that often times recreational areas were geared to attract people from outside areas rather than take into account the needs of the local communities. Three respondents foresee an increase in small businesses, soft manufacturing, and industry in future years. Two respondents indicated a need for a sewer system in the rural areas of the Rio Chama and Española areas. Three were concerned about a need for greater county, state, and federal planning in regard to future

population growth and the maintenance and creation of infrastructure to accommodate that growth. One would like to see greater county involvement in the maintenance of the traditional lifestyles of local natives. One from Cebolla expressed a need for a dam in his area to curb the effects of droughts and to contribute to recreation, wildlife, and rancher needs.

Overall there is an awareness of population growth that is predicted to continue in the Rio Chama area and northern New Mexico. There is also a feeling that this growth will require greater planning effort in terms of infrastructure and water availability, and that the water and land rights of the existing community must be honored while at the same time allowing for the expansion of traditional land and water use practices.

Eleven of the seventeen respondents noted environmental or land-use concerns. Environmental concerns included contamination of the ground water supply by septic systems and other sewage disposal methods; surface water pollution; depletion of the aquifer; loss of wildlife and game animals; degradation and erosion of forested areas, riparian areas, and stream banks; and trash and traffic pollution generated by some of the local businesses. Land-use concerns included the loss of agricultural lands to housing developments and subdivision; too much free or low cost use of resources available on public lands; a loss of common lands surrounding land grants; and a loss of grazing rights on public lands. One respondent was concerned about wide-spread illegal water use from rivers and wells and would like to see more enforcement of current laws regarding water use and distribution.

Four respondents mentioned the need for preservation of water rights and the importance of this issue in the future. Three indicated a need for the establishment of a water conservation program and the importance of water conservation for agriculture in light of downstream urban (Santa Fe and Albuquerque) water demands.

✦ Following are various quotes taken from the surveys:

“We need the water desperately. Our system needs to make sure we supply adequately what we need now and try to foresee uses in the future. There will always be needs that we haven’t thought of and therefore a reserve [of water] should be put aside for such growth.” - Roy-El Morgan Farm, Rio Chama

“Expand on agricultural water use, and expansion of livestock as need arises.”  
- Agustin R. Garcia, Abiquiu

“Population growth certainly a factor to consider in projecting future water needs. The more people the more services will be needed. Housing and business expansion will be a major factor to consider for use of existing water. Before recreation areas are considered one must take into [account] the planning [of] water needs of these projects. Overall planning is needed by communities, county, regional, and state. Central water system is needed for the entire valley and water disposal system is also needed.” - Garfield J. Gutierrez

“Chamita community growing at a fast pace.” - Juan Archuleta, Chamita

“What we need in Cebolla is a dam to hold the spring runoff to help the community in mid summer with water shortages. With a dam built we could have better fishing areas. I think with building a dam wildlife will benefit. We all have a hard time in mid summer because of drought.” - Ernesto Archuleta, Cebolla

<b>Table A29. Rio Chama Acequia Commissioners</b>					
<u>Name</u>		<u>Address</u>	<u>Community</u>	<u>State</u>	<u>Zip</u>
Frank	Archuleta	Rt. 4 Box 7	Hernandez	NM	87532
Gilbert	Archuleta	Box 1764	Espanola	NM	87532
Juan	Archuleta	Box 2	San Juan Pueblo	NM	87566
Remijio	Archuleta	Box 55	Abiquiu	NM	87510
James	Balkey	Box 737	Medanales	NM	87548
Fred	Berry	144 Camino Escondido	Santa Fe	NM	87501
Karl	Bode	Box 707	Abiquiu	NM	87510
Joe	Boise	Box 150	Abiquiu	NM	87510
Abbott	Br. Phillip , O.S.B.	Mon. of Christ in the Desert	Abiquiu	NM	87510
Mustafa	Chudnoff	Box 146	Abiquiu	NM	87510
Benito	Cordova	Box 183	Abiquiu	NM	87510
Lucas	Cordova	Box 87	Hernandez	NM	87537
Cordelia	Coronado	General Delivery	Medanales	NM	87548
Frank	Corova	Rt. 4, Box 1	Hernandez	NM	87537
Juan	Duran	Box 1	Abiquiu	NM	87510
Pete	Fresquez	Route 3 Box 340C	Espanola	NM	87532
Adan	Garcia	Box 323	Espanola	NM	87532
Augustine	Garcia	Box 184	Abiquiu	NM	87510
Eloy	Garcia	Box 1024	San Juan Pueblo	NM	87566
Filimon	Garcia	Box 101	Abiquiu	NM	87510
Leroy	Garcia	P.O. Box 38	Abiquiu	NM	87510
Manuel	Garcia	Box 233	Espanola	NM	87532
Patricio	Garcia	P.O. Box 381	Espanola	NM	87532
Pedro	Garcia	General Delivery	Medanales	NM	87548
Mark	Garity	Box 700	Abiquiu	NM	87510
Ubaldo	Giron	Box 136	Abiquiu	NM	87510
Miguel E.	Gonzales	Box 58	Abiquiu	NM	87510
Garfield	Gutierrez	Box 727	Espanola	NM	87532
John	Hallock	Box 102	Abiquiu	NM	87510
Abel	Herrera	Box 703	Medanales	NM	87548
Tomas	Herrera	Box 137	Abiquiu	NM	87510
Elberta	Honstein	Box 2129	Espanola	NM	87532
Archie	Jaramillo	Box 24	Abiquiu	NM	87510
Johnny	Jaramillo	General Delivery	Abiquiu	NM	87510
Fred	Lopez	Rt. 4 Box 305-4	Espanola	NM	87532
Gabriel	Lopez	Box 161	Abiquiu	NM	87510
Juan D.	Lopez	Box 32	Abiquiu	NM	87510
Ralph	Madesen	Box 400	Abiquiu	NM	87510
Andy	Maestas	P.O. Box 502	Abiquiu	NM	87510
Elmer	Maestas	Rt. 2 Box 13	Hernandez	NM	87537
Michael	Maestas	Box 36	Hernandez	NM	87537
Procopio	Maestas	General Delivery	Abiquiu	NM	87510
Herman	Manzanares	West Route Box 1	Abiquiu	NM	87510
Salomon	Manzanares	Box 931	Abiquiu	NM	87510
Albert	Martinez	Box 65	Hernandez	NM	87537
Alfonso	Martinez	Box 4	Abiquiu	NM	87510
Archie	Martinez	Drawer KK	Espanola	NM	87532
Arthur A.	Martinez	Box 1568	Espanola	NM	87532

## Rio Chama Acequia Commissioners

A30

Daniel	Martinez	Box 166	Abiquiu	NM	87510
Richard	Martinez	Box 508	Abiquiu	NM	87510
Sammy	Martinez	Box 116	Abiquiu	NM	87510
Sixto	Martinez	Box 742	Medanales	NM	87548
Kathy	McMath	Box 57	Abiquiu	NM	87510
Aubrey	Owen	Box 75	Abiquiu	NM	87510
Ron	Rundstrom	Box 1791	Espanola	NM	87532
Gregorio	Salazar	General Delivery	Medanales	NM	87548
John	Salazar	Box 63013	Espanola	NM	87532
Joseph	Salazar	Box 1744	Espanola	NM	87532
Richard	Salazar	Box 1330	San Juan Pueblo	NM	87566
Henry	Salazar	Box 542	Espanola	NM	87532
Ernest	Sema	Box 632	Espanola	NM	87532
Clara	Suazo	Box 27	Abiquiu	NM	87510
Arturo	Trujillo	Box 295	Espanola	NM	87532
Fidel	Trujillo	Box 1268	San Juan Pueblo	NM	87566
Jackie	Trujillo	Box 130	Abiquiu	NM	87510
Virgil	Trujillo	Box 187	Abiquiu	NM	87510
A.B.	Valdez	P.O. Box 4425	Espanola	NM	87532
Eli	Valdez	2913 Camino del Gusto	Santa Fe	NM	87505
Manuel R.	Vigil	Route 1 Box 2D	Hernandez	NM	87537
Miguel	Vigil	Box 662	Espanola	NM	87532
Gerald	Winsemius	General Delivery	Hernandez	NM	87537

Ranger  
U.S. Forest Service

January 13, 1997

Dear Ranger,

We are in the process of obtaining information pertaining to water uses in the Rio Chama Basin. This information will be compiled into the Regional Water Plan which will address present and projected water needs within the Basin. This Plan will be instrumental in securing and legitimizing our water needs with respect to future water policy (budgeting) and water availability.

Could you send us information pertaining to present and projected water uses of the Forest Service? Please take some time to answer the questions on the included form and return it to the above address. Any additional information concerning water use in your area will also be appreciated and included.

Thank you for your time, the outcome of our collective efforts will result in a Water Plan that will help protect the quality and quantity of water within our Basin. Please give me a call at the above number if you have any questions, concerns, or ideas.

Sincerely,

Fred Vigil

Fred Vigil  
Rio de Chama Acequia  
Association  
P.O. Box 687  
Medanales, NM 87548  
(505) 753-4519

A32

Ranger  
U.S. Forest Service

January 13, 1997

- ① Identify and estimate the water needs of Forest Service facilities in your district.  
(i.e. lawns, gardens, domestic water needs, etc.)
  
- ② What is the present housing situation for Forest Service personnel?  
(number of houses, occupants per house)
  - Please identify the drinking water sources and waste water treatments employed at your facilities.
  
- ③ Do you foresee an expansion of Forest Service facilities in the next 40 years? Explain:
  - Buildings, housing, other facilities:
  
  - Agriculture expansion (irrigated acreage, crops, pasturelands, animal husbandry, barns, corrals, etc.):
  
  - Water and sewage treatment systems:
  
- ④ What other changes, developments, and/or expansions do you foresee that might affect water use or availability in your area in the future?



### A33. Forest Service Survey Summary

On January 13, 1997, the Rangers of each of the three Districts (El Rito, Canjilon, and Coyote) in two National Forests (Carson and Santa Fe) of the Rio Chama basin were mailed survey forms requesting information pertaining to the water uses and projected water needs of their Forest Service facilities and Districts. The surveys asked the current and projected water needs of Forest Service in regard to domestic and agricultural water uses. The two responders from the Coyote and El Rito Districts outlined present water uses and predicted future water needs for their Districts. This information will take into account the needs of the Forest Service for Regional Water Planning in the Rio Chama basin.

The Coyote District reported using a total of 36 acre/feet of water for domestic and livestock purposes from two springs located in the vicinity of the Ranger Stations. The buildings use septic systems and the facilities serve a total of 16 people in 8 residences. The El Rito District is watering about 1 acre from an unmetered local well and is also connected to the El Rito Domestic Water User's Association. There are no meters so actual water use cannot be determined. An office, residences, and a warehouse accommodate from 12 to 30 people and use an on-site evaporative treatment facility for waste water treatment.

Facilities in the Coyote District could double in the next 40 years with ranch and other developments requiring a potential total of 470 acre/feet of water. Additional office and housing space could also be an issue but is not planned at this time. Wells and septic systems at three Coyote District Campgrounds may be developed in the next 40 years. Expansions of the El Rito District could include the development of additional irrigated horse pasture although no area has been identified. The El Rito District office complex is currently being remodeled and expanded which includes expansion of the waste water treatment facility.

John Miera of the Coyote District noted that "wildfire suppression needs may increase as area develops" and "livestock and domestic needs may increase as population grows."

**Table A33. U.S. Forest Service Districts within Rio Chama Basin**

John Miera U.S. Forest Service Santa Fe National Forest Coyote District P.O. Box 160 Coyote, NM 87012	Kurt Winchester U.S. Forest Service Carson National Forest El Rito District P.O. Box 56 El Rito, NM 87530	Gene Onken U.S. Forest Service Carson National Forest Canjilon District P.O. Box 488 Canjilon, NM 87515
--	--	--

Chief  
Fire Department

January 17, 1997

Dear Chief,

The Rio de Chama Acequia Association is in the process of gathering information pertaining to water uses in the Rio Chama basin. This information will be compiled into a Regional Water Plan for the Rio Chama drainage basin and is part of a state-wide undertaking to address present and projected (40 years) water needs of the communities within the various watershed drainage basins in New Mexico. The effort of Regional Water Planning was set in motion by the State Legislature and is overseen and funded by the Interstate Stream Commission. The resulting Regional Water Plans, with their forty-year horizons, will be instrumental in securing and legitimizing our water needs with respect to future water availability and water policy as well as helping to insure the continuity of the water supply given future growth and development demands.

Could you send us information pertaining to present and projected water uses of the Fire Department? Please take some time to answer the questions on the included survey and return it to the letter head address by February 10, 1997. Any additional information concerning water use in your area will also be appreciated and included. It is crucial that you respond to this questionnaire so we will be able to include your water needs for future water planning. If you fail to respond, you may find yourselves in a water shortage in the future.

Thank you for your time, the outcome of our collective efforts will result in a Water Plan that will help protect the quality and quantity of water within our Basin as well as insure that our community and fire protection needs are met for the future. Please give me a call if you have any questions, concerns, or ideas.

Sincerely,

Fred Vigil  
753-4519

Fred Vigil  
Rio de Chama Acequia  
Association  
P.O. Box 687  
Medanales, NM 87548  
(505) 753-4519

A35

Chief  
Fire Department

January 27, 1997

- ① What is the service area (by district, area, population, # of households, etc.) of the Fire Department?
  
  
  
  
  
  
  
  
  
  
- ② How does the Fire Department fulfill its water needs?
  - Does the Fire Department have its own well? If yes, what are the specifications of the well (size, capacity, flow/minute, etc.)?
  
  
  
  
  
  
  
  - If you do not have your own well, from what source does the water supply come (mutual domestic, acquirement of water rights, etc.)?
  
  
  
  
  
  
  
  - If you do not have your own well, how do you plan to remedy future Fire Department water needs?
  
  
  
  
  
  
  
  
  
  
- ③ Estimate how much water the Fire Department uses per year:
  
  
  
  
  
  
  
  
  
  
- ④ Estimate how many fires are responded to by the Fire Department per year:
  
  
  
  
  
  
  
  
  
  
- ⑤ Do you foresee a need for expansion of Fire Department facilities (additional Fire Departments, etc.) in your area in the next 40 years? Explain:
  
  
  
  
  
  
  
  
  
  
- ⑥ What other changes, developments, and/or expansions do you foresee that might affect water use or availability in your area in the future?

### A36. Fire Department Survey Summary

On January 27, 1997 survey forms were sent to 12 Fire Chiefs in the Rio de Chama drainage basin concerning water uses and projected water needs of their Fire Departments. The surveys asked the extent of the service area, water supply infrastructure, estimated water use, and predictions for future water needs. Seven responders from Abiquiu, Canjilon, Cebolla, Chamita, Ghost Ranch, Laguna Vista Estates, and Lumberton Fire Departments outlined water uses and identified their future water infrastructure needs. This information provided an overview of issues and concerns of the Fire Departments and will help gear the Regional Water Plan for the communities within the Rio Chama drainage basin by providing for their fire protection needs.

The Fire Departments service the areas of their respective locations as listed below. This list was compiled directly from survey responses. Brackets are used to clarify responses.

**Abiquiu:** Cañones, Abiquiu Dam & Acre Estates, Ghost Ranch, Abiquiu and surrounding communities, south of Abiquiu on both sides of the Chama River including Medanales and Rio Chama. Los Palacios on HWY. 84 north of Chile is the boundary.

**Canjilon:** About 120 households in Canjilon and Cebolla.

**Cebolla:** 150 households.

**Chamita:** Chamita (400 households).

**Ghost Ranch:** Ghost Ranch Conference Center.

**Laguna Vista Estates:** area 4 × 10 miles with 270 [property] owners. [not all lots have homes]

**Lumberton:** 45 families, 2 cafes, 2 private schools, 1 gas station, and 12 ranches on a 50 mile radius.

The Fire Departments fulfill their water needs through a variety of methods. Ghost Ranch and Laguna Vista Estates have their own well to provide for their water needs. Abiquiu, Canjilon, Cebolla, Chamita, and Lumberton use water from Mutual Domestic Water Associations and hydrants. Abiquiu, Canjilon, and Laguna Vista Estates use surface water from acequias, rivers, tributaries, springs, lakes, and ponds in addition to their respective groundwater sources. The following table outlines water supply sources for the seven responding Fire Departments.

Fire Department	Mutual Domestic	Private Well	Surface Water
Abiquiu	✓		Rio Chama River, tributaries, and Acequias
Canjilon	✓		Spring above Canjilon Lakes, ponds, and Acequias
Cebolla	✓		
Chamita	✓		
Ghost Ranch		✓✓	
Laguna Vista Estates		✓	Lake, ponds
Lumberton	✓		

The following table shows the number of fires and the quantity of water used for each Fire Department per year.

Fire Department	Water per year	Fires per year
Abiquiu	20,000 gallons	Approx. 20
Canjilon	10,000 gallons	Varies (2 to 8)
Cebolla	30,000 gallons	Approx. 15
Chamita	50,000 gallons	75 fire calls
Ghost Ranch	1,000 gallons	1 on Ghost Ranch Property
Laguna Vista Estates	3,000 gallons	Varies (4 to 6)
Lumberton	35,000 gallons	2 house fires

Five of the respondents ( Abiquiu, Canjilon, Cebolla, Chamita, and Lumberton) noted population increases in their areas that would require further development of water infrastructure for fire protection such as hydrants, wells, and pumps for their respective areas in the future. One (Laguna Vista Estates) noted the need for the construction of a sub-station and another the need for the acquirement of additional water rights from the state. One ( Abiquiu) concerned with population growth also had concern about water pollution, storage rights, industrial and commercial use affecting water supply in the future. Chief Alex Sisneros Jr. of Chamita Fire Department indicated a need for the expansion of Fire Department facilities due to "population increase and conversion of farm land to residential."

✦ The following are various quotes taken from the surveys.

"[We] do not know if natural flow waters will be restricted in future. We may have to drill wells."

"In a drought year like the spring and early summer of 1996 fire departments consume more water because of the drought and more fires."

"I believe the growth in population and demand for water will greatly impact the rancher and the use [of water] for domestic livestock."

"We do not speculate that the inflow of migrants will decline in the coming years. I believe the population will increase [thus] needing more fire protection."

- Chief Juan Lopez, Abiquiu Fire Department

"We need our own well"

"Community growth average of 8 households per year"

- Ernesto Archuleta, Cebolla Fire Department

"If Domestic Water Systems can not provide sufficient water for growth, [the] Fire Department may need to get water from other sources. Acequias, rivers, or any other water sources. The greater the population, the greater the need for water."

- Chief Alex Sisneros Jr., Chamita Fire Department

"We need more fire hydrants."

"We are starting to see more people moving into our area every year."

- Chief Chris Lucero, Lumberton Fire Department

**Table A38. Fire Departments within the Rio Chama Basin**

Chief Juan Lopez Abiquiu Fire Department P.O. Box 11 Abiquiu, NM 87510	Chief Ronald Martinez Canjilon Fire Department P.O. Box 516 Canjilon, NM 87515	Ernesto Archuleta Cebolla Fire Department P.O. Box 163 Cebolla, NM 87518
Chief Alex Sisneros Jr. Chamita Fire Department P.O. Box 1389 San Juan, NM 87566	Chief Eliza Martinez Coyote Fire Department P.O. Box 51 Coyote, NM 87012	Chief Tony Pena Dulce Fire Department P.O. Box 507 Dulce, NM 87528
Chief Willie Picaro Ghost Ranch Fire Committee Ghost Ranch Abiquiu, NM 87510	Chief Bill Davison Laguna Vista Estates Fire Dept. HC - 75 1001 Los Ojos, NM 87551	Chief Chris Lucero Lumberton Fire Department P.O. Box 102 Lumberton, NM 87547
Chief Salomon Manzanares Medanales Fire Department P.O. Box 931 Abiquiu, NM 87510	Chief Justiniano Valdez Tierra Amarilla Fire Department P.O. Box 41 Tierra Amarilla, NM 87575	Chief Manuel Gurule Vallecitos Fire Department P.O. Box 221 Vallecitos, NM 87581

To: Water System

February 3, 1997

Dear operator,

The Rio de Chama Acequia Association is in the process of gathering information pertaining to water uses in the Rio Chama basin. This information will be compiled into a Regional Water Plan for the Rio Chama drainage basin and is part of a state-wide undertaking to address present and projected (40 years) water needs of the communities within the various watershed drainage basins in New Mexico. The effort of Regional Water Planning was set in motion by the State Legislature and is overseen and funded by the Interstate Stream Commission. The resulting Regional Water Plans, with their forty-year horizons, will be instrumental in securing and legitimizing our water needs with respect to future water availability and water policy as well as helping to insure the continuity of the water supply given future growth and development demands.

Could you send us information pertaining to present and projected water uses of your water system? **If you receive this letter and are no longer the operator of this water system, please forward to the appropriate person.** Please take some time to answer the questions and return to the above address by February 21, 1997. Any additional information concerning water use in your area will also be appreciated and included. It is crucial that you respond to this questionnaire so we will be able to include the water needs of your area for future water planning. The information you provide will be confidential and used only for the purposes of assessing our water supply and planning your water needs for the future.

Thank you for your time, the outcome of this effort will result in a Water Plan that will help protect the quality and quantity of water within our basin and insure that our water needs are met in the future. Please give me a call if you have any questions, concerns, or ideas.

Sincerely,

Fred Vigil  
753-4519

To: Water System operator

January 29, 1997

- ① What is the service area of the water system?
  - How many connections does the water system have?
  - What is the population that the water system serves?
  - Do you have maps that show your water lines and locations?
- ② Estimate how much water is used annually by the mutual domestic system per year (gals/day):
  - How does current use compare with that of past years?

· Current	· Last yr	· 2 yrs ago
use(gals/d): _____	use(gals/d): _____	use(gals/d): _____
- ③ How does the water system fulfill its water needs?
  - If the system is serviced by groundwater well(s), what are the specifications of the well(s)? (number of wells, discharge rate, depth, size, capacity, flow/minute, etc.)
- ④ Has the water system experienced any quality or quantity problems in the past?
  - If yes, identify problems (types of bacteria, nitrates, other chemicals, dry wells, etc.).
  - How were these problems fixed?
- ⑤ Do you foresee a need for expansion in water system services in the next 10 years? 40 years?  
Explain:
  - How does the water system plan to meet future water demands (purchase of water rights, additional wells, deeper wells, etc.)?
- ⑥ What other changes, developments, unmet needs, and/or expansions do you foresee that might affect water use or availability in your area in the future?



## A41. Water System Survey Summary

On January 29, 1997 survey forms were sent out to the operators of 57 Mutual Domestic Water Associations and other public and private water systems within the Rio Chama drainage basin. The surveys asked for information pertaining to the service area, water use, water supply, water quality, and projected needs, issues, and concerns of the water system and its service area in the future. Twelve responders from Abiquiu, Canjilon, Cebolla, Gallina, Coyote, El Rito, Ghost Ranch, and Tierra Amarilla outlined water use, infrastructure, and needs for their systems and service areas. This information provided a general overview of issues and concerns of the water systems and will help gear the Regional Water Plan to take into account the needs of the population within the Rio Chama basin.

According to the U.S. Census Bureau, the use of public water systems and private water companies (five or more connections per well) by the population within the Rio Chama basin accounts for 52% of domestic water use. Water system respondents reported water use that ranged from 320 gallons/day for a campground transient population to 17,250 gallons/day for an elementary school of 350 persons. The following table summarizes water use by the 12 water systems as reported by the operators.

Water System	Con- nections	Pop- ulation	Current Use (gallons/day)	Last year use (gallons/day)	2yrs ago use (gallons/day)
Abiquiu Dam	1	transient	320-5,000	same	same
Abiquiu Elementary	2	160	7,800	6,750	6,000 (approx)
Barranco MDWCA	23	60	± 9,000	± 8,000	± 5,000
Canjilon Water System	130	400	26,000	30,000	25,000
Cebolla MDWCA	66	150	13,500	9,000	/
Coronado High School	> 10	< 400	10,959	same	same
Coyote MDWCA	35	20	220	200	200
Coyote Ranger Station	13	42	850	same	1000
Ghost Rance Conf. Cntr	45	15 +	15,000	14,367	15,677
Hernandez Elementary	2	350	17,250	15,600	13,800 (est)
Placitas MDWCA	90	360	13,151	12,329	10,685
Rio Arriba County Detention Center	3	~ 65	1,000	800	

Ten of the twelve responding operators have maps that show water lines and their locations. The following table shows the water source and infrastructure specifications for each responding water system that reported this information (7 of 10).

Water System	Source	Yield	Depth
Abiquiu Dam	1 well	20 gal/min	370 ft
Abiquiu Elementary	1 well	40 gal/min	160 ft
Canjilon Water System	spring	50 gal/min	--
Coronado High School	1 well	19.63 acrefeet	170 ft
Coyote MDWCA	1 well	60 gal/min	90 ft
Coyote Ranger Station	spring	11 gal/min	--
Ghost Ranch Conf. Center	2 wells	40g/m combined	210 ft
Hernandez Elementary	1 well	40 gal/min	200 ft
Placitas MDWCA	2 wells	13 gal/min 9 gal/min	20 ft 700 ft

Six of the twelve of the respondents reported problems their water system has experienced from shortages, chemical contaminants (nitrate, iron, etc.), or bacterial infestation. Ghost Ranch Conference Center reported "fairly hard water with fairly high TDS" that was treated with a water softener in the kitchen. The following table shows the types of reported problems and solutions (if any) for the responding water systems.

Water System	Problems	Solutions
Abiquiu Elementary	chemical contamination	water filters by Culligan
Canjilon Water System	bacteria	switched source from creek to spring
Cebolla MDWCA	• bacteria • water shortage in summer	• filtration sytem/chlorine pumps • never been solved
Coyote MDWCA	iron - problem w/water lines	not solved
Hernandez Elementary	nitrates and chlorination	chlorination
Placitas MDWCA	bacteria after spring runoff	chlorination

Eight of the eleven respondents foresee a need to increase water system services in the future due to a growing population or to serve existing population not currently serviced. Abiquiu Elementary plans additional wells or community water hookup to accomodate an expanding population. Barranco MDWCA plans a bigger storage tank, bigger pump, and bigger main line. Canjilon Water System plans meet future water demand by tapping into additional springs. Cebolla MDWCA plans to develop water sources from the National Forest. Hernandez Elementary plans additional wells or community water hookup for an expanding population. Placitas MDWCA plans to purchase additional water rights, develop a new well, or tie all three comunity wells together. The Rio Arriba County Detention Center needs to expand the capacity of the facility and wants to join in with the community of Tierra Amarilla Water System.

Finally, Barranco MDWCA foresees a development of water meters to control water usage. Canjilon Water System also needs to replace galvanized pipes, old pressure reducing valves, and air release valves; add fire hydrants; and add about three miles of additional water line. Cebolla MDWCA is concerned about surface water contamination and Coronado High School would like to install a filtration system.

✚ Following are various quotes taken from the surveys.

“System has grown from 55 members in 1973 to 130 in 1996.” - Canjilon Water System

“Too numerous bacteria to count - we [also] have a galley (surface water) well which runs low every summer.” “Installed filtration system and chlorine pumps...water shortages have never been solved.” “Right now we only serve 50% of the community, we’re in the process of connecting everyone if the legislature provides us money for additional water source.” “We will be facing major problems because of surface water contamination and there are no study of wells around the area.” - Cebolla MDWCA

“People here have been using old wells that were in existence before the State became a State, or before Rules and Regulations took effect.” “I think we have enough water to meet most expansions within reasonable growth.” - Coyote MDWCA

“The communities in and around El Rito continue to grow almost daily. This growth will place additional pressure on existing resources. A Los Alamos Lab study projected 35% growth in northern New Mexico by the year 2000.” - Placitas MDWCA

“If more area (Ghost Ranch or neighboring private land) is used for residential housing, then more wells will have to be put in.” - Ghost Ranch Conference Center

# The Llaves Lindrith Area Community Conservation Association Comments for Water Plans

The Llaves Lindrith Area Community Conservation Association (LLACCA) is an association of community members representing the two communities of Llaves and Lindrith and their surrounding areas. LLACCA was formed to represent these areas because neither area contains an incorporated community nor are there any other organizations that collectively represent these areas. The Llaves and Lindrith area encompasses approximately four hundred (400) square miles including:

1. 205 square miles of private land
2. 35 square miles of BLM land
3. 160 square miles of National Forest land

This area is included exclusively in Rio Arriba County but the geography of the Continental Divide splits the watershed in two. To the east of the divide is the Llaves area which lies in the Gallina/Rio Chama watershed and to the west of the divide Lindrith lies in the Largo/San Juan watershed. For this reason LLACCA has split its plan, needs and recommendations into two separate tables based upon the individual watershed characteristics of each of the two communities of Llaves and Lindrith.

The Llaves and Lindrith areas are experiencing noticeable growth in their respective populations with many new landowner/residents purchasing land in these communities for their primary residences. The majority of the land use remains agricultural in nature with livestock grazing and limited farming being the two primary agricultural endeavors. Additionally, there is a trend developing in both communities where new land owners purchase their land for recreational and residential development. Both communities have small Public Water Systems that service some but certainly not all residents. It should be noted that the Lindrith Public Water System services the Lindrith Elementary School.

The major economic resource for the Llaves and Lindrith areas is energy development including both oil and natural gas production. Energy production is also the largest employer in the area as well as being the largest user of water for their exploration, development, completion and production of oil and natural gas.

The following charts demonstrate the best estimates of the LLACCA for the reasonable foreseeable water requirements over the next forty years:

## Chart 1

### Llaves Area (Gallina/Rio Chama Watershed)

Surface Area (approximately)

Private: 50 square miles

BLM: 10 square miles

National Forest: 80 square miles

Approximate Total: 140 Square Miles

### Forty Year Estimate of Annual Water Needs

Ninety (90) domestic and livestock wells on private and BLM land:	270 acre feet
Ten (10) livestock wells on National Forest land:	30 acre feet
Community Water System servicing eighty (80) families:	240 acre feet
Energy needs for twenty (20) surface/seep feed tanks on private, BLM and Forest land	60 acre feet
Wells for energy production needs on private, BLM and National Forest land:	Unknown
Surface impoundment structures-Private Land:	250 acre feet
Surface impoundment structures-BLM:	50 acre feet
Surface impoundment structures-Forest:	400 acre feet
Unknown number of erosion control structures:	(estimate) 700 acre feet
	<b>Estimated Total: 2,000 acre feet</b>

## Chart 2

### Lindrith Area (Largo/San Juan Watershed)

Surface Area (approximately)

Private: 150 square miles

BLM: 30 square miles

National Forest: 80 square miles

Approximate Total: 260 Square Miles

### Forty Year Estimate of Annual Water Needs

270 domestic and livestock wells on private and BLM land:	810 acre feet
Ten (10) livestock wells on National Forest land:	30 acre feet
Community Water System servicing sixty (60) families:	180 acre feet
Energy needs for Forty (40) surface/seep feed tanks on private, BLM and Forest land:	120 acre feet
Wells for energy production needs on private, BLM, and National Forest land:	Unknown
Surface impoundment structures-Private Land:	750 acre feet
Surface impoundment structures-BLM:	150 acre feet
Surface impoundment structures-Forest:	400 acre feet
Unknown number of erosion control structures:	(estimate) <u>1,300 acre feet</u>
	<b>Estimated Total: 3,740 acre feet</b>

### Conclusions

The Llaves Lindrith Area Community Conservation Association sincerely believes our comments and estimates reasonably reflect the foreseeable requirements for the forty year planning horizon. We respectfully request that our comments and tables be included in the final planning documents as part of the permanent record.

The Llaves and Lindrith areas will continue to grow in their population of landowners. The continuing production and development of energy resources are essential to the area and America's energy needs and initiative toward national greater energy independence. The continuation of agricultural production and the nature of the rural communities are important economic and cultural needs of this area as well as to our nation. Each of these require adequate water for the certain growth and future survival of the Llaves and Lindrith areas.

We believe that there is increasing need to manage the volume and velocity of runoff and the inevitable erosion damage. Therefore, we have included an estimated amount although it will primarily return to the natural water cycle through increased percolation and evaporation. We also believe that a feasibility study is warranted to consider the possibility of larger impoundment and erosion control structures. If feasible, these types of structures could be placed strategically on some of the larger drainages for erosion control and small scale irrigation.


Respectfully Submitted

Llaves Lindrith Area Community Conservation Association



Matt Stevenson

Secretary



Darlene Schmitz

Treasurer



L. D. Schmitz

Director



Steve Stevenson

cc: Rio Arriba County Planning Department

Fred Vigil  
Rio de Chama Acequia Association  
P.O. Box 687  
Medanales, NM 87548  
(505) 753-4519

Chama Domestic Water Supply  
P.O. Box 794  
Chama, New Mexico 87520

July 23, 1998

Dear Operator,

The Rio de Chama Acequia Association is in the process of gathering information pertaining to water uses in the Rio Chama basin. This information will be compiled into a Regional Water Plan for the Rio Chama drainage basin and is part of a statewide undertaking to address present and projected (40 years) water needs of the communities within the various watershed drainage basins in New Mexico. The effort of Regional Water Planning was set in motion by the State Legislature and is overseen and funded by the Interstate Stream Commission. The resulting Regional Water Plans, with their forty-year horizons, will be instrumental in securing and legitimizing our water needs with respect to future water availability and water policy as well as helping to insure the continuity of the water supply given future growth and development demands.

My representative, Sabino Rivera, would like to meet with you to discuss present and projected water uses for the Chama Domestic Water Supply System. He will be in contact with you to set an appointment at your earliest convenience. Please take some time to answer the questions on the included survey and send it with my representative. It is crucial that you respond to this questionnaire so we will be able to include your water needs for future water planning. If you fail to respond, you may find yourselves in a water shortage in the future. **If you receive this letter and are no longer the operator of this water system, please forward to the appropriate person.**

Thank you for your time, the outcome of our collective efforts will result in a Water Plan that will help protect the quality and quantity of water within our Basin as well as insure that our community-needs are met for the future. Please give me a call if you have any questions, concerns, or ideas.

Sincerely,

Fred Vigil

Microsoftword A:MDWCA.dot

TO: Village of Chama Water System

1. What is the service area of the water system?

- How many connections does the water system have?
- What is the population that the water system serves?
- Do you have maps that show your water lines and locations?

2. Estimate how much water is used annually by the village water system per year (gals/day):

How does current use compare with that of past years?

Current                      Last yr                      2 yrs ago  
use(gals/d): \_\_\_\_\_ use(gals/d): \_\_\_\_\_ use(gals/d): \_\_\_\_\_

3. How does the water system fulfill its water needs?

- If the system is serviced by groundwater wells(s), what are the specifications of the well(s)? (number of wells, discharge rate, depth, size, capacity, flow/minute, etc.)

4. Has the water system experienced any quality or quantity problems in the past?

- If yes, identify problems (types of bacteria, nitrates, other chemicals, dry wills, etc.).

- How were these problems fixed?

5. Do you foresee a need for expansion in water system services in the next 10 years? 40 years?

- How does the water system plan to meet future water demands (purchase of water rights, additional wells, deeper wells, etc.)?

6. What other changes, developments, unmet needs, and/or expansions do you foresee that might affect water use or availability in your area in the future?

7. Has the Village of Chama considered using gray water for irrigation?

8. Does the Village of Chama use acequias for irrigating lawns and gardens?

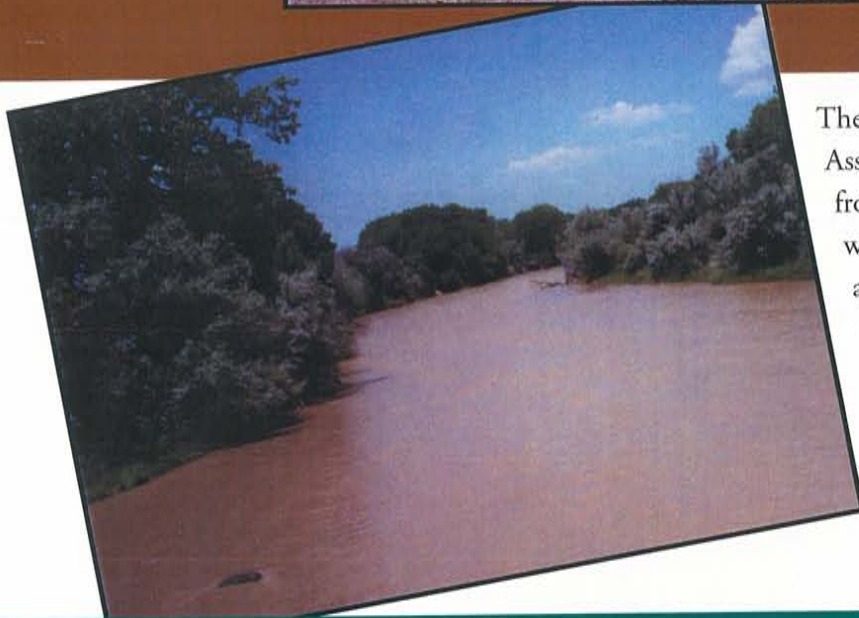
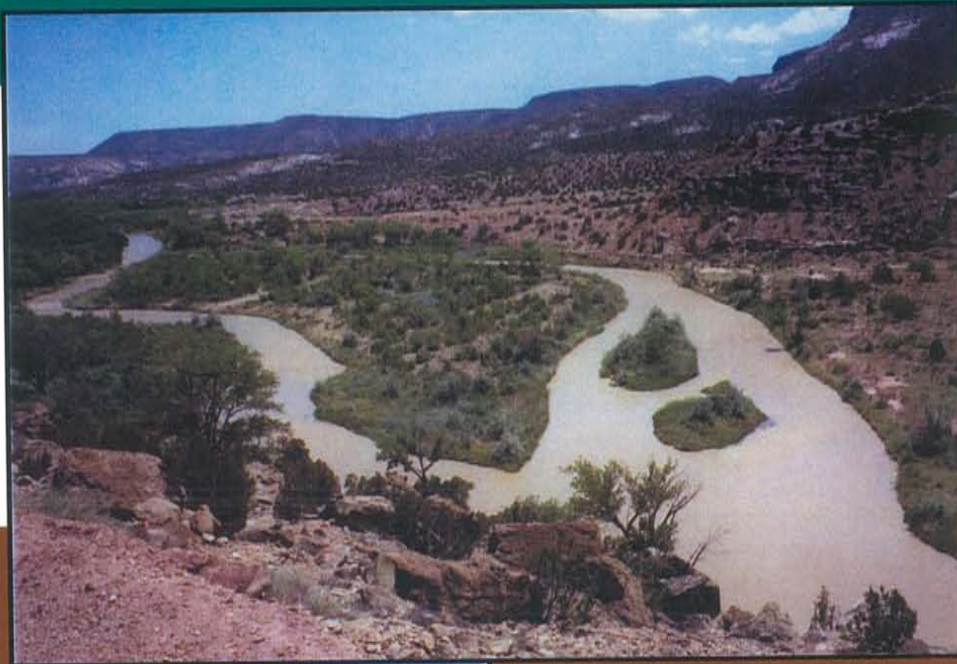


JULY 2003

# RCAA News

THE RIO DE CHAMA ACEQUIAS ASSOCIATION

Water is a  
critically  
important  
resource  
for our  
future.



The Rio de Chama Acequias Association needs input from all communities and water users in formulating a regional water plan for the Rio Chama watershed.

*Please see page 4*

**Send us your thoughts!  
Return the enclosed  
questionnaire!**

Serving acequias and communities in the Rio Chama Valley.

## The RCAA Mission

Maybe the most important natural resource there is, besides our children, is water.

In the arid Southwest cultures have survived because they have adapted their behavior to the natural environment that supports life. One of the principal missions of the Rio de Chama Acequias Association (RCAA) is to help our contemporary communities make these adaptations and preserve both our natural resources and our cultural traditions successfully and sustainably into the 21st century. We have been fortunate to have help from the American Friends Service Committee (AFSC) in many activities that contribute to these goals and help keep our acequias flowing and also involve the next generation in protecting our heritage. Some of the most important of these activities have been:

- Developing and supporting an adjudication team (a lawyer, hydrologist, historian, community liaison, ethnohistorian, and a steering committee) to represent our acequias in the water rights adjudication process in the lower Rio Chama valley. Without AFSC support the demands placed on local communities by the state and federal legal systems might well have been impossible to meet.
- Young people have been trained to help with water quality sampling to test well water for contaminants. The information

gathered in this program has been shared with well owners, Rio Arriba County, and the State.

- Support for the Adopt-a-Watershed project, where students in three elementary schools learn about water quality, riparian life, and how they fit into the ecology of the of the community where they live.
- Grassroots involvement in goal-oriented, problem-solving community activities that empower residents, whether young or old, men or women, to participate in water rights adjudication and other aspects of water management. At least partly as a result, more women are now serving as acequia commissioners and board members of the RCAA.

Many of us may remember gaining our first experience with gardening, and watering, with our mothers in the fields, alongside other women and children in our villages. We need to make sure this knowledge and these experiences are passed on to the next generation. The closeness to the earth and the faith that develops from working the earth is deep and long-lasting.

## REGIONAL WATER PLANNING

The Rio de Chama Acequias Association is closely involved in preparing a regional water plan for the Rio Chama watershed, to be submitted by the end of the year to the New Mexico Interstate Stream Commission as part of a statewide water plan. We have pretty well finished collecting all the hydrological information available of the Rio Chama and its tributaries, on water uses and future demands, and on water quality issues. Information summaries have been prepared for four regions within the Chama watershed: the upper Chama area, the lower Chama, El Rito and Ojo Caliente, and the Gallina-Puerco de Chama-Polvadera area.

We are also collaborating with Rio Arriba County in providing water information for use in County general planning. Water is a critically important resource for our future, but it also needs to be considered along with other important facets of life, like agricultural land, housing, transportation, and economics. We are making an active effort to include consideration for acequia needs in the planning process.

Help us envision a sustainable future for the Chama valley. We need to set priorities, look for water management alternatives and pick the best ones, and figure out how to make it all happen. Meetings have been taking place in communities across the Rio Chama watershed, and we need your input! Please send in the enclosed questionnaire, and feel free to call the RCAA at 685-4768 for more information.

**Please take a minute to fill out the questionnaire inside this newsletter, and return it to us (it's already addressed).**

## RCAA member acequias

Acequia de Chamita  
Acequia de Hernández y San José  
Acequia de los Salazares  
Acequias de Chili y la Cuchilla  
Acequia Río de Chama  
Acequia de los Martínez  
Acequia de los Duranes  
Acequia de Jose V. Martínez  
Acequia Tierra Azul  
Acequia de la Puente  
Acequia de Mariano

Acequia Valentin Martínez  
Acequia Quintana  
Acequia J. P Gonzales  
Acequia de Gonzales  
Acequia de Abeyta y Trujillo  
Acequia del Pueblo de Abiquiu  
Acequia del Barranco  
Acequia Ranchitos  
Acequia de Manzanares y Montoya

Acequia Suazos  
Ghost Ranch  
Monastery of Christ in the Desert  
Acequia de Maestas  
Acequia de los Frijoles  
Acequia de Esquibel  
Acequia Karl Bode

## Bad News & Good News

We might as well start with the bad news – even though we finally got some snow late in the spring, it's still a pretty dry year for the Rio Chama. There were up to seven feet of snow on the ground in the mountains above Chama, but the ground was so dry that most of the snowmelt soaked into the ground instead of filling the river.

The good news is that the Rio de Chama Acequias Association has enough San Juan - Chama Project water stored in Abiquiu reservoir for all member acequias to irrigate this summer. The Association purchased this water from Ghost Ranch and the City of Albuquerque. RCAA member acequias used about 1,400 acre-feet of this water in 2002, leaving us with about 3,450 acre-feet in storage. We want to use this water very conservatively so we have as much as possible left for future dry years.

The New Mexico legislature appropriated funds to purchase this water in 1995, and it's not certain that funds will be available in the future. It is also unlikely that we will be able to purchase water from Albuquerque in the future because they have said they intend to use all their San Juan - Chama water.

We have followed the traditional customs of water sharing in using RCAA's stored water in the past. Before the imposition of a water rights system based on priority dates, all acequias reduced their water use in dry years so there would be some water for everyone. We tried this again in a limited way last year, when all acequias irrigating from the lower Chama stopped irrigating for three weekends. The streamflow gage at Chamita showed considerable water savings, and that's part of the reason we still have 3,450 acre-feet of water to use.

For this summer, RCAA has agreed that stored water in Abiquiu reservoir will be available to acequias that agree to participate in the water-sharing and conservation program, where we will again voluntarily not irrigate at least one day a week.



## Water Banking

There is a lot of talk about “water banking” around New Mexico these days. Several bills were considered by the Legislature this year on water banking in various forms. The basic idea behind water banking is that someone with water rights who is not going to use all their water can make it available to someone else without losing their water rights.

There are some important questions though, such as:

- How far away is it appropriate to move water – to another parciante on the same acequia, elsewhere on the same stream, within an acequia association, to a mutual domestic water association, or anywhere in the state?
- How long can water be used elsewhere without danger of losing water rights?
- Can banked water be stored for use later?
- Who gets compensated for using banked water?
- Can acequia commissioners regulate or prevent water banking?

A number of legal and practical issues still need to be ironed out with the Office of the State Engineer. The RCAA is working on a proposal for water banking to be presented to members this year for discussion.

## A letter to all our parciantes

*from Fred Vigil, President of RCAA*

Dear Irrigators,

It's worth stopping to reflect on how it's been possible for us to keep on irrigating even in times of drought, as we experienced last summer (and will undoubtedly see again in the future). The answer is: good planning by the Rio de Chama Acequias Association. For a lot of last summer, there was essentially no native water flowing down the Rio Chama – the river was dry above El Vado reservoir. All the water actually flowing down the river was imported by the San Juan – Chama Project. Our water rights as acequias on the Rio Chama are to native flows in the river, but not to San Juan – Chama water. The RCAA, however, purchased rights to use some imported water during shortages and times of drought, and this is the water that we used for irrigating for much of last season.

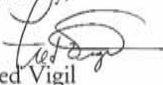
As you have all experienced, drought and periodic water shortages are a fact of our agricultural lives, and we will always have to deal with them. Finding additional water for use during shortages is one important thing we can do. Last year, member acequias agreed to shut down on a rotating basis for one day a week as a voluntary water conservation measure and a way to cooperatively share the burden of drought. Because of the success of the voluntary conservation effort, we didn't run out of water, the acequias ran throughout the irrigation season, and we avoided more drastic measures that might have been imposed on us. It makes a great illustration of how cooperation among acequias can share resources, minimize burdens and disruption, and reap the benefits of community members working together.

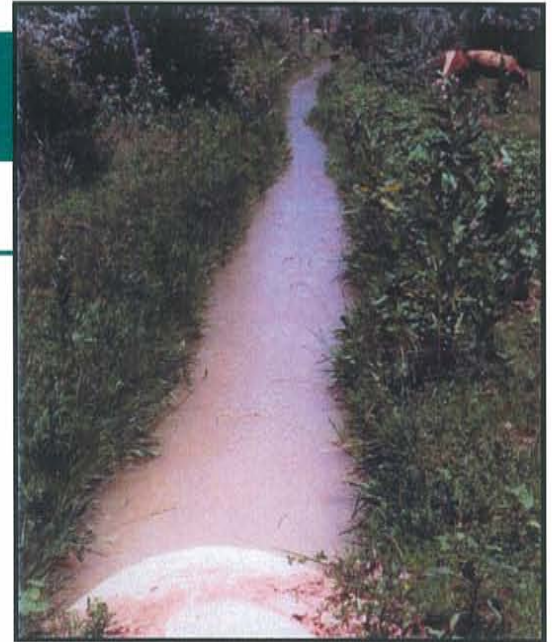
This year, again we have some imported water available, but it's still a dry year and we will still need to voluntarily conserve water supplies and share the burdens equitably. Let's keep up the good work!

Last but definitely not least, please be sure to remember basic acequia manners: always close your head gate and pass the water on to your neighbor as soon as your time is up, and don't let anything get thrown into the ditches. Trash or other junk in the ditch will plug up culverts or cause washouts, and in fact it's illegal and can result in prosecution by the state Environment Department.

Have a great irrigation season.

Sincerely,

  
Fred Vigil  
President, RCAA



## Bylaws...

The structure of any association begins with its bylaws, and they lay the foundation for its success. The Rio de Chama Acequias Association is planning an event to raise awareness of how important good acequia bylaws are, and explain the procedure for creating or changing acequia bylaws.

Good bylaws need criteria for:

- ◆ Membership
- ◆ Dues and officers
- ◆ Nominations, elections, and terms of office
- ◆ Duties and responsibilities of officers
- ◆ Officer and membership meetings
- ◆ Ways to change bylaws if needed

It is the right and responsibility of each member to understand the bylaws and participate in setting them up or changing them.

Acequias are legally a form of local government in New Mexico, and they must operate in a way that complies with state law. The Rio de Chama Acequias Association is proud to have developed a set of draft bylaws, reviewed by our lawyer, that are available for member acequias. We look forward to presenting them soon in a bylaw workshop.

## **RIO CHAMA REGIONAL WATER PLANNING COMMUNITY MEETING DISCUSSION TOPICS**

### **Domestic and community water supply**

- How well is the community water system working? Is it providing enough water? Are there problems?
- Were there water shortages in the dry summers of 1996 or 2002 (or any other time?)

### **Water quality**

- Is there any water testing information? Any need for additional water testing?
- How about wastewater treatment? Several areas in our region have problems with ground water pollution, and many communities along the Rio Chama are vulnerable to water pollution because the water table is shallow. Is this a problem where you live?
- Are there problems with erosion or sediment buildup in streams or acequias? Is there a lot of erosion going on?

### **Acequias and irrigation**

- How well are the acequias working? Are there problems in serving all the irrigable land (i.e. does it take a lot of water just to get to the end of the acequia; are there particular maintenance problems; is it a lot better higher on the ditch - or does everybody get served about the same)?
- How often/how severe are shortages? What happens in a shortage: are there water sharing arrangements among the acequias in this community? If so, do they work well?
- What are the trends in irrigated land use – is more land being irrigated (or would people like to irrigate more land); or is land going out of use?
- Does anybody sell crops or livestock? What kind? Where do they sell them?
- Do any parciantes want to sell water rights or transfer water elsewhere? Has this happened in the past in this area?
- How important is it to you, or to your neighbors, to keep water in the fields instead of somewhere else? What will happen, or should happen, as water becomes more and more valuable in downstream cities?

### **Planning for the future**

- How well will the water system serve future needs? Is population growing much? Are there households that would like to be on the community system but aren't able to? If so, why is that – location of their houses, capacity of the system to provide water, pumping problems, something else?
- Will there be new uses or needs for water in the future?
- Do you need more water in this community? What for? Or is it more a matter of wanting to protect what's already here, but it's basically enough?

## Meeting notes – El Rito, Northern New Mexico Community College

July 15, 2003

### *General comments on hydrology, water supplies, and watershed management*

- Some springs and cienegas are visibly drying up this year or over the past few years – seems like local water tables at least are in fact dropping
- One specific well has a noticeable response to rain and/or irrigation of land around the well, but it takes a few months to see the response (well will produce water for longer at a time).
- Plan should suggest forest thinning where appropriate as a possible way to increase runoff/recharge; and should definitely recommend lots of small erosion-control check dams, which will also increase aquifer recharge and reduce flash flooding.
- We should support increased beaver populations in the high country, again to store water, reduce flash flooding, and increase water supplies.
- One important need for water in Chama valley communities is to enhance recharge to make up for depleted aquifers.
- It might really help in securing funding etc. if the County were more actively involved in acequia and water issues (and could provide assistance, seed money, funding information, or other support).

### *Domestic and community water supplies*

- Amount of domestic well rights transferred to mutual domestics needs to be recalculated – 0.25 acre-foot per year now used in the area is probably inadequate for MDWUA needs. Probably should be 0.3 to 0.5 af/y.
- MDWUA members who still have domestic wells may need to take steps to prove beneficial use to keep their water rights.
- Mutual systems don't always have capacity for fire fighting; combined storage could be possible if fire marshal's office could contribute to storage tank costs, for example.
- Seems like other agencies (like State Fire Marshal?) should share costs/responsibilities for providing fire hydrants; participants have heard that some kind of state fire protection fund has surpluses that sometimes revert to the General Fund.
- MDWUAs need to be sure they don't lose water rights from once-connected houses that may be abandoned.
- It would be nice to know how much water a swamp cooler uses (or other uses particular to our area that may not be included in standard water use calculations.
- Need education on how much water can be wasted by leaky fixtures and pipes.

### *Acequias and irrigation*

- “Maybe 3/4” of acequia parciales are not actively and consistently irrigating any more; and about 10% of the potential crop land is actually planted to anything intentional.
- What would convince people to plant and/or irrigate again is if they could make some money doing it.
- We should consider the former role of acequias in providing domestic water, and see if we could encourage people to water domestic gardens/landscaping with acequia water rather than domestic wells.
- Explore the possibilities of aquifer recharge with acequias.
- There used to be a custom of cleaning out and repairing spring boxes or springs, which should be encouraged again.
-

Meeting notes – Medanales, Medanales Community Center  
July 17, 2003

*General comments on hydrology, water supplies, and watershed management*

- There is more water in the ditches this year than last, but the ground is still very dry from last year.
- Water in the river below Abiquiu Dam seems more turbid than usual.
- The spring that supplies the Abiquiu community system is not flowing as much as it was last year.
- Need to find a better alternative to old tires for erosion prevention etc.

*Domestic and community water supplies*

- Concern was repeatedly expressed about the proliferation of new domestic wells and their effect on ground water levels and river flows.
- Many new wells may still be unpermitted by the OSE.
- There should be some control over the total numbers of new wells drilled; it shouldn't be an automatic approval.
- Perhaps all new building ought to be required to be on a community system, since total numbers of connections and total water use would be easier to monitor and control.
- Ground water development ought to be more closely controlled, like surface water rights now are.
- Many well bores are not sealed between aquifers, resulting in contamination migrating from shallow aquifers into previously clean deeper aquifers. There should be better enforcement of well driller licensing and well construction standards.
- There should be better enforcement of the liquid waste disposal regulations; many liquid waste systems are in violation.
- Better, probably centralized, wastewater treatment should be a higher priority.
- Domestic well permits should be for less than 3 acre-feet per year.

*Acequias and irrigation*

- Pretty much everyone with water rights is using them and irrigating; and many people who are not now irrigating would like to if they could get water rights.
- Some acequias have real problems keeping up with routine maintenance needs.
- There is a problem with younger people being interested in keeping up with acequia work and responsibilities.



- Local employment, even non-agricultural employment, would help agriculture in the sense that it would be easier for people to farm part-time if they had local jobs.
- Vocational agriculture education would be a big help in keeping people interested in farming and helping people make at least a partial living from it.
- Water banking should not extend outside the lower Chama area at this point; it's important for the water to stay tied to the land it now irrigates.
- Aquifer replenishment using acequia water should be explored.
- The prohibition against moving water uses above or below Otowi Gage should be maintained.

**Meeting notes – Gallina, Gallina Elementary School  
July 29, 2003**

*General comments on hydrology, water supplies, and watershed management*

- Participants came to the meeting much more concerned that water planning or other government interaction would hurt them or interfere with their water, rather than hopeful that it could lead to useful assistance of some sort
- Most ditches are highly weather dependent; the amount of water available is highly variable based on the amount of snowpack or summer rainfall; not necessarily perennial; one ditch in particular typically runs dependably from April through June (but that's enough to be important for hay production).
- Many of the new wells in the area are over 500 feet deep.

*Domestic and community water supplies*

- Community water systems routinely experience problems with wells not providing enough water, requiring residents to restrict water use, etc.
- One participant has a 260-foot well that occasionally goes dry when pumped; other people in the vicinity have wells over 500 feet deep.
- Ghost Ranch wells are usually pretty independent of surface weather; don't drop much in dry years.
- People are definitely still moving into the area (new mobile homes arrive regularly, for instance).

*Acequias and irrigation*

- Parciantes in the area are not giving up on water rights or on irrigation; people who no longer live in the community will come back when it's their turn to water, to be sure they don't lose their water rights.
- Acequias do have plans for infrastructure improvement, but they believe they can do the work themselves and won't need assistance.
- At least one acequia already has a bylaw provision transfer of water rights away from the acequia without approval.
- It's really important to preserve the agricultural infrastructure so people will have the option to live on the land and the region will have potential agricultural capacity in the future.
- Acequias serve important environmental needs as well as strictly agricultural ones, such as wildlife habitat enhancement, aquifer recharge, and landscape aesthetics. These environmental services have a substantial value not determined by the number of individual people served by an acequia, or even by its value to the local community.

**Meeting notes – Tierra Amarilla and Chama, interviews with stakeholders  
July 31 and August 12, 2003**

*General comments on hydrology, water supplies, and watershed management*

- Protecting upper watersheds – thinning and controlled burning where appropriate, preventing further residential or recreational development, managing grazing to maintain some grassland but prevent erosion, and so forth – is a very high priority.
- Many ditches are highly weather dependent; water supplies dwindle or disappear after snowmelt is gone (often by June).
- Village of Chama municipal wells hit water with dissolved mineral problems (arsenic, for instance) at about 500 feet; new wells will be drilled to about 1000 ft.; but domestic wells can find water at maybe 20 feet.
- Many people in Chama have their own domestic wells (in addition to connection to village system); and access to acequia water.
- Village of Chama has been operating with outdoor watering restrictions for some time (3 days/wk.).
- Gray water use would be welcome where feasible.
- Surface and ground water should be administered together since they are so closely linked in most of the area.
- No development should be allowed without prior acquisition of valid water rights.
- Acequia water supplies should be preserved from development effects and be considered off-limits as sources for development water rights.
- The State should consider renegotiating the Rio Grande Compact to allow more water storage at higher altitudes to minimize evaporation (and benefit acequias).

*Domestic and community water supplies*

- New emergency well is top priority for Village of Chama.
- New water treatment “pod” for existing plant (to increase capacity); along with new wastewater treatment plant.
- Village has water supply master plan and wastewater treatment designs in progress with consulting engineers.
- Additional water storage (tanks) for village would also be helpful.
- Village is in the midst of major effort to install water meters for all its connections.
- Village is planning extension of water system to some outlying areas, as soon as funding becomes available.

- Wastewater treatment is important, especially in areas with any population density.
- Wastewater treatment ought to be required to be in place with the same priority as provision of new water rights/supplies before new development is allowed.

### *Acequias and irrigation*

- Relatively small (but multiple) storage reservoirs in high mountain valleys would be perhaps the highest priority for the acequia systems, besides the overall goal of keeping water on the land and available for acequias.
- Acequias are generally opposed to water storage for “aesthetic” or recreational uses, however; and proposals were made that nay new storage structures be required to have outlet works such that they could be emptied into acequia systems when needed.
- Storage for stock tanks should require the applicant to have a registered brand and perhaps a minimum number of cattle.
- Water transfers, through water banking or otherwise, should be limited to the basin where the water originates.
- It’s really important to preserve the agricultural infrastructure so people will have the option to live on the land and the region will have potential agricultural capacity in the future.
- Acequias serve important environmental needs as well as strictly agricultural ones, such as wildlife habitat enhancement, aquifer recharge, and landscape aesthetics. These environmental services have a substantial value not determined by the number of individual people served by an acequia, or even by its value to the local community.
- Better procedures are needed for adjudication: more administrative, less legal and adversarial. Adjudication should be more streamlined and less expensive, but should also not put acequias in the position of adversaries to the State – the state should be more supportive of acequia water rights and political position.
- Acequias should have a legal status different from other water users (similar to the status of Indian water rights), because of their unique political status and historical position.
- Important not to allow acequia water to be leased for long periods (ie, keep it to 10 years or less), so that whole generations can’t go by without access to water.
- Opportunities exist for more efficient water use – such as field leveling, if incentives were there.
- It might be acceptable to lease some water to downstream users (say, in wet years), as long as it helped fund acequia or agricultural improvements and didn’t hurt acequia operation in dry years.

**Meeting notes – Tierra Amarilla, State Water Plan meeting  
August 18, 2003**

*General comments on hydrology, water supplies, and watershed management*

- We need more information on how much water there really is.
- There are forest areas that are too dense, create fire danger, and use too much water.
- Acequias need to be protected.
- Development needs to be restricted or prevented in upper watershed areas.
- We should try to salvage excess runoff water when it's available.
- We should see if desalination of highly mineralized water would work here.
- Beaver ponds in forested areas help store water and moderate runoff peaks.
- The effects of gravel mining (now occurring near Chama) should be investigated to see if it's damaging the river or ground water.
- Acequias can help slow runoff and provide temporary water storage in fields and shallow aquifers that provide baseflow to streams.
- The effects of a drought are felt immediately in the upper Chama because areas further downstream, including lower in the Rio Grande, benefit from reservoir storage and/or greater ground water reserves.
- The whole idea of assigning water rights according to a fixed acre-footage every year doesn't work, because stream flow is so variable. Rights holders should get a percentage of the flow instead of some arbitrary number.
- Measuring and metering acequia flows would be a good idea, but only if return flows (including subsurface recharge of shallow aquifers) could be included.

*Acequias and irrigation*

- Additional water storage for acequias might benefit other water users too.
- Acequias and parciantes were not at the table when compacts were negotiated.
- Acequias should get special legal status and protection because of their status under the Treaty of Guadalupe Hidalgo.
- The role of acequias in communities in northern New Mexico is different than the role of ditches and conservancy districts in the rest of the state.
- People are illegally impounding water in what are called "stock tanks" but are really just for recreation; these are impairing senior water rights in places.
- The value of acequias to northern culture and community life is far greater than just the commodity value of water or agricultural production.

- Adjudication needs to be streamlined and less adversarial and cumbersome.
- Ditch lining would have lots of bad consequences, such as loss of riparian habitat, removal of valuable trees, degrading the landscape, and diminishing cultural values.
- We need local aquifer recharge that is provided by acequias.
- Some selected places might benefit from carefully chosen acequia lining or repairs, but this would not be a benefit everywhere. We need to look very carefully at all the impacts.

*General policies and public welfare considerations*

- Protect acequias wherever possible.
- Rivers, floodplains/fields, and acequias should be thought of as an integrated ecological-hydrological unit.
- We have to accept that water is a limited resource.
- Ground water and surface water should be thought of and managed together.
- Water quality should get more emphasis.
- Watershed management should get more care and attention.
- Water transfers must benefit the community as a whole, not just some rights holders.
- We need to enhance perennial flows in streams through watershed management and/or additional water storage.
- There should be more stringent limits on new domestic wells and stock tanks.
- Acequias and rural communities should be empowered to participate in water transfer decisions; it shouldn't just be a free-for-all market system. There need to be limits to the private property nature of water rights.
- There need to be limits to the quantities of water that could be exported from local areas, and acequia commissions should have authority over transfer requests.
- Agricultural (i.e. acequia) water conservation is possible if there are adequate benefits for acequias and parciantes. We need to change the "use it or lose it" water rights system.

## RIO CHAMA REGIONAL WATER PLANNING COMMUNITY WATER QUESTIONNAIRE

Below are listed some of the issues and concerns about water that have been mentioned in various communities around the Rio Chama watershed. Not all of them may apply to your community, and not all of them are equally important in all communities. **Please rate each one on a scale of 0 to 10, with 0 meaning that it's not really a problem or concern at all for you, and 10 meaning that it's a major problem that will urgently need to be solved to ensure adequate water supplies for the future in your community.**

\_\_\_\_\_ Maintaining or repairing the existing community water system to make sure it is reliable (without necessarily increasing its capacity).

\_\_\_\_\_ Expanding the capacity of the community water system so that it can serve more people, or increasing the water supply available for existing users.

\_\_\_\_\_ Testing private well water to be sure it's not contaminated.

\_\_\_\_\_ Providing better wastewater treatment to reduce water pollution.

\_\_\_\_\_ Repairing or maintaining particular problems with the acequias.

\_\_\_\_\_ Providing additional water supplies, of possible, for the acequias in your community so that they can serve existing irrigated land better.

\_\_\_\_\_ Making it possible to irrigate additional land.

\_\_\_\_\_ Finding better ways to share water or collaborate among parciantes on acequias; or achieve more effective acequia governance.

\_\_\_\_\_ Finding ways to support or assist local agriculture (such as developing better marketing, providing technical assistance, making low-cost financing available, or other help).

\_\_\_\_\_ Restore and/or protect upper watersheds to reduce erosion and perhaps help make streamflow more perennial and dependable.

**Are there other problems or suggestions about water in your community, in addition to those listed above?**

**What do you think are the top three priorities in your community to make sure there is enough water for the next 40 years?**

**Any additional comments? (please write on the back).**

Issue or concern	Community ranking (1 is highest priority)				
	Upper Chama	Unknown	Gallina	El Rito	Lower Chama
1 – Maintain existing water system	8	4	2	9-10	8
2 - Expand water system	5	6	7	4	9
3 – Test private wells	10	8	8	7	7
4 – Better wastewater treatment	7	2	9	2	6
5 – Repair acequia problems	1-4	3	1	8	2
6 – More acequia water for existing fields	1-4	9	3	3	4
7 – More water to irrigate additional land	8	10	4-5	9-10	10
8 – Better acequia collaboration/ governance	6	5	10	5	5
9 – Assistance for local agriculture	1-4	7	4-5	6	3
10 – Upper watershed restoration	1-4	1	6	1	1



Residents along the Rio Chama were asked to express any additional concerns they had regarding water use and preservation at the end of the questionnaire.

The first question asked: **Are there other problems or suggestions about water in your community, besides those listed above?**

Residents living in the lower Rio Chama area offered the following responses:

- Need to build flood control dams above Espanola and north to Medanales. We need these dams for the protection of the integrity of our acequias from flood damage.
- Help develop a community sewage system so ditches and wells stay clean and not polluted from septic tanks from all the new modular/trailer homes
- Water should not be sold out of our acequia system
- There should be some restrictions on new wells
- Restrictions on transferring water out of our communities
- Restriction on domestic wells
- As irrigators, "native" waters are not for sale to anyone
- It is important to restrict or prevent water from being transferred out of our communities
- It is important for domestic wells to be able to have the right to pump 3 acre feet per year
- Prevent water from being sold or transferred from community
- Contaminations
- They want to put small farmers out of business
- Keep water systems in local communities
- The issues mentioned above are well formed and cover the main challenges in our area
- Anticipate needs for the future
- Perhaps create community water system
- Limit water rights for new wells
- Keep the water rights tied to the land

Residents whose location was unknown offered the following responses:

- Mayordomos that are informed of his duties and willing and able to enforce by-laws
- Maintaining and keeping the ditches clear is the biggest problem
- Ensure that those that have water rights continue to have water rights in the future
- It seems that many of the cities (Santa Fe and Albuquerque, etc.) are buying water rights when the water does not exist. There are more water rights than there is water...Bottom line!
- Historical water users (farmers, ranchers, acequias) have a higher priority buying water that is not there
- Need to encourage use of agricultural water rights for agricultural purpose
- The time to construct water projects to get water to the communities in the northern area of the water system is too long. It would be good if this project could be expedited.
- State and Federal governments need to help with grants for major improvements

Residents of Gallina offered the following responses:

- Combine water and sewer systems
- Storage for acequias
- Water for irrigating has value above and beyond the actual cash value of the crop

Residents of the Upper Chama area offered the following responses:

- Monitor the water use by installing meters and installing wells
- Need to stop illegal water impoundments on streams

Residents from El Rito and Ojo Caliente offered the following responses:

- Shifting water from agriculture to residential and industrial uses is a dangerous shift for the economic health of the region and nation
- Supporting and assisting local agriculture through youth programs that give experience in profitable crop production
- Restore and protect upper watersheds by forest thinning, and constructing check dams and ponds – influencing the aquifer and reducing evaporation

The second question asked: **What do you think are the top three priorities in your community to make sure there is enough water for the next 40 years?**

The following are the responses from the residents of the lower Rio Chama to the second question.

- 1. Providing additional water supplies, 2. Finding better ways to share water, 3. Restore and/or protect upper watersheds
- 1. Make sure the water is saved for agricultural use and not sold to developers or Albuquerque or Texas, 2. Keep farmers farming the bosque/ river side lands, 3. Encourage voluntary conservation
- 1. Water supply, 2. Irrigation water, 3. Waste treatment
- 1. Watershed restoration, 2. Education of wise use of water, 3. Implementation of conservation practices
- 1. Continue negotiation for native water, 2. Cooperation among acequia members and RCAA, 3. Maintenance of the acequias, presas, etc.
- Education to the population and possibly mandating conservation practices – Maybe giving some sort of compensation to those practicing conservation ideas
- Cooperation between commissioners and parciantes in a long term run – long length of time
- Repairing or maintaining particular problems with acequias
- 1. Prevent water from leaving community, 2. Conservation of water, 3. Construct waste water facility and reuse water
- Conserve water – Make better ways of using water
- Conservation and improved water quality
- Recycle waste water and gray water
- Storage
- Conservation
- Storage
- The community is going to grow a lot bigger within the next 40 years
- Tradition/ culture

- No Compromise – Use it don't lose it. Water is for fighting, Whiskey is for drinking
- 1. Water conservation measures, 2. Better wastewater management, 3. Improve education about resource use, generosity, consideration of the environment and other beings, and mutual respect and how all of these aspects contribute to enhancing water politics
- 1. Adequate use of existing water supply, 2. Conservative uses of water, 3. Conscientious sharing of existing water between neighbors
- An understanding of needs
- 1. Controlled growth on well permits, 2. Conservation of water, 3. Regional sewage treatment
- 1. Community water and sewage systems, 2. Controlled growth, 3. Agricultural training/experience for youth
- 1. Thinning and logging of forested lands, 2. Put out/suppress forest fires, 3. Manage wilderness areas – Watersheds are impacted negatively when there are fires in the area
- 1. Control growth, 2. Do not lose water rights, 3. More involvement by all concerned
- 1. Wells, 2. extension lines
- 1. Develop storage facilities, 2. Acequias need to continue the customs and history therefore need support and assistance, 3. Acequias need to be involved in any compact or plan to be developed

Residents along the Rio Chama with unknown addresses responded to the second question in the following way:

- People need to take more interest (who uses the water) in water affairs and learn to irrigate correctly
- 1. Maintenance, 2. Sharing of water, 3. By-law enforcement and available to all members
- Making sure that water is not wasted and that only people who have water rights and comply with the rules can water
- Make sure that the parciante (performs) irrigating checks on his water instead of allowing it to run for days at a time in some spot. Ask permission from mayordomo to use water so he can keep better track of water useage. Plant more draught resistant crops to help conserve water. Water at night when possible to help with evaporation
- Lining and maintenance of the Hernandez acequias
- Ensure farmers, ranchers, and acequia users to continue to have their rights on water (especially Hispanics). Make sure environmentalists know how they are impacting the farmer and rancher who depend on water to make a living. Will the rancher become extinct? Protect the irrigated lands of Rio Arriba and other counties from too much development. Let developers develop the dry lands. Put a stop on creating any more water rights, the water does not exist. Make sure industry does not contaminate surface and ground water: Intel. Which is more important, water or jobs, and who will pay the price at the end?
- Prepare to address industrial and municipal desire for "agriculture water" as they pursue their agenda to acequia agricultural water rights. Even water for domestic use in rural areas is threatened by industrial and municipal interests. The essence of our rural way of life and community is threatened
- 1. Population increase 2. Less annual rainfall 3. Less snow fall than prior years
- Ditch lining throughout. Too much water lost through leaching

Residents of El Rito responded to the second question in the following way:

- Verify that population growth does not exceed water growth. Minimize the wasting of water. Recharge aquifers – check dams, infiltration galleries
- Preserving agricultural water rights, Promoting profitable agriculture, Waste water systems to preserve water quality
- 1. Waste water treatment for El Rito, 2. Check dams on arroyos etc. to retain water and check soil erosion, 3. Aspen grove restoration for beaver recuperation program, 4. Education campaign
- Recharge aquifer, rebuild water systems, reduce water in homes, limit water loss

Residents of Gallina responded to the second question in the following way:

- To keep all the old methods used for generations
- Use water rights
- Expansion of domestic systems
- Water is a sub-issue of a healthy environment, maintain irrigable land, think ahead 200 years not just 40
- No sale of existing water rights, No new industries that use large volumes of water

# What is regional water planning, anyway?

*Do we have enough water for our future needs? Where is it coming from?*

Water planning just means getting together as a community to answer those questions, with technical experts to help us.

There are 16 water planning regions in New Mexico, established by the Interstate Stream Commission. Each region can write its own water plan, and then the ISC will combine them into a statewide water plan. Our region is the valley, or watershed, of the Rio Chama and all its tributaries.

A council of citizens is in charge of writing the plan. They hire experts to collect information, make sure community concerns are considered, and evaluate different ways to meet our future water needs. Council meetings are held in different communities all over the region. Contact the Rio de Chama Acequias Association at 685-4048, and find out how to participate in your water future!

*Water planning is a way to work together to keep as much water as possible available for all of us in the region. It has nothing to do with determining who has water rights, and is completely separate from the legal process of water rights adjudication.*

# Water for the Future ...



In the  
Rio  
Chama  
Valley

Brochure photographs courtesy of Cipriano Martinez

**Regional Water Planning  
in our communities**

Coordinated by the Rio Arriba County  
Planning Department and the Rio de Chama  
Acequias Association

Rio de Chama Acequias Association  
PO Box 687  
Medanales, NM 87548

## Why should we care about a “Regional Water Plan”?



- ◆ So we can provide water for our growing communities, our households, and new economic opportunities without drying up the fields and acequias.
- ◆ So we can make better use of the water we have, and get more benefit from it.
- ◆ So we can help make sure that water users outside the region or the state don't look to our resources when we need them.

- ◆ So we can help keep the fields green and the acequias running into the next millennium, finding ways for our agricultural heritage to adapt to the 21st century.

## What's happening now?

We are gathering information on how much water we really have, and how much we are using. But the most important job is to figure out how much water we'll need for the future, and what kind of future we want.

***Right now we're asking how much water we'll need for farms and ranches, for households and communities, for possible new industries or businesses, and other uses, for the next forty years. When we know that, we'll need to make sure we know where it's coming from.***

Hydrologists and other scientists can add up the figures, but it's up to us to make the real decisions. The way we can do this as a community is through the Citizens' Advisory Council that oversees the whole water planning job.

***Come to any of the Committee meetings held throughout the Chama valley and find out more.***

## WE NEED YOU!

To get involved, contact:

**Rio de Chama Acequias Association at 685-4048, or Rio Arriba County Planning Department at 753-7774**



A Citizens' Advisory Council was established in 1995 to start working on a water plan for our region. The Council decides what questions we need to answer, oversees the experts collecting information, makes sure community concerns are considered, and evaluates different ways to meet our future water needs. As we continue with water planning, the Council will be more and more actively involved. It is important for it to represent all the people and interests affected by how we use water in the Chama valley. Meetings are always open to the public and anyone can participate.

***Call one of the phone numbers listed above and come to the next meeting!***

**THE MOST IMPORTANT THING ABOUT PLANNING FOR OUR WATER FUTURE IS THAT IF WE DON'T DO IT, SOMEONE ELSE WILL DO IT FOR US.**

# WATER

in the lower Rio Chama watershed



The Rio Chama Acequias Association is collaborating with Rio Arriba County to develop a Regional Water Plan for the Rio Chama watershed. We are collecting information about how much water is available, what we use it for, and how much we'll need in the future. This fact sheet summarizes information about water along the Rio Chama below Abiquiu Reservoir, including Abiquiu, Barranco, Medanales, Rio Chama, Chili, Hernandez, and Chamita. It is intended to help us understand more about how much water we have and how water affects our lives. We hope it will help residents participate more effectively in both regional water planning and county general planning.

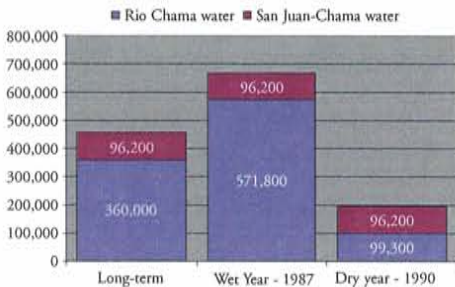
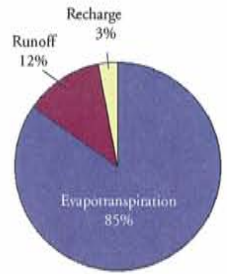


Most of what we know about water in the Rio Chama is actually based on estimates and not on direct measurements. As of now we can't actually measure most of the things we want to know: streamflow (in most tributaries),

water use, return flows, and so on – so these all have to be estimated. Estimates are based on assumptions and calculations that may not be completely accurate, but it's the best information we have.

## Water Supply

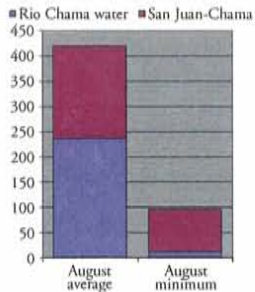
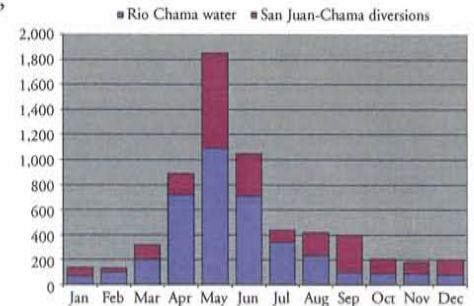
All the water we have ultimately comes from precipitation. Even the deepest ground water is just rain or snowmelt stored underground. The water in streams, and ground water recharge, are just a small part of all the precipitation that falls on our watershed. The chart to the right illustrates what happens to the precipitation we get: about 85% evaporates or is used by vegetation pretty much where it falls, 12% or so runs off in streams, and 3% or less recharges ground water.



Precipitation (and everything else about water in New Mexico) is extremely variable. Average native streamflow past the Chamita gage is about 360,000 acre-feet per year, and the San Juan – Chama Project adds 96,200 acre-feet a year to that. However, in a wet year, flows are almost 60% more than average, while in a typical dry year we only get about a fourth of the average.

But total annual flow is only part of the story. Flows vary a lot throughout the year too, and for irrigation it's the flows during the growing season that count. The next chart (to the right) shows average flows through the year.

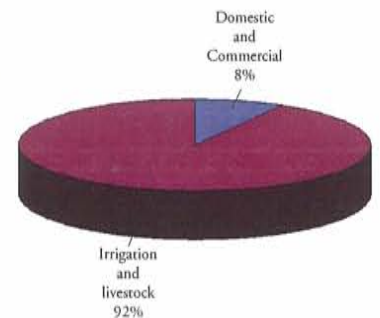
Our irrigation rights are based on “native flows”, or the water that would be in the river if the reservoirs weren't there and there was no San Juan – Chama water. To irrigate all the land served by lower Chama acequias in mid-summer takes at least 140 cubic feet per second of streamflow. As the chart shows, on average there is enough water in the river most of the time, except perhaps in September and October. But this is a chart of average flows, and many times flows are a lot less than average.



As an illustration, we can compare average flows for the month of August with the minimum flows recorded for August. The average total flow during August is over 400 cubic feet per second (cfs), and about 235 cfs is native Rio Chama water. However, the minimum recorded flow for August, including San Juan-Chama water, is less than 100 cfs, and the minimum native flow recorded was only 10.5 cfs. So even though average flows may be enough, there are times when native flows are much less than we need to irrigate all the land. To help with these times of shortage, the RCAA has leased a small amount of San Juan-Chama water, stored in Abiquiu Reservoir.

## Water Demand and Uses

Irrigation accounts for about 92% of all the water we use below Abiquiu, with domestic and commercial uses making up 8%. Not all irrigation diversions (and no return flows) are measured, so water use has to be estimated from the total acreage irrigated and calculations about how much water the crops need. Most of the water diverted onto the fields eventually returns either to streams or to ground water – the State Engineer estimates that 65% to 75% of the water withdrawn becomes return flow. In other words, we have to divert three or four times as much water as the crops actually need to be sure of getting enough water to all the fields.





The table to the right summarizes estimated irrigation demand if all irrigated land were adequately watered.

But of course the fields are not always adequately watered. Estimates of historical supply, or the amount of needed irrigation water actually supplied, have not been done for this area but we all know that in the dry years not everything gets watered enough.

Domestic and commercial water use, as we saw above, makes up a about 8% of total water use. Our total population in the Rio Chama watershed below Abiquiu Reservoir is about 7350 people, increasingly concentrated towards Española. Total domestic water consumption is about 660 acre-feet per year, and commercial consumption perhaps 50 acre-feet in addition. Just like irrigation diversions, there is substantial return flow from domestic uses, mainly effluent from septic tanks – and this has brought some water quality problems with it.

Stream reach or tributary	Irrigated acreage	CIR* (ft/yr)	Depletion (acre-ft./yr)	Diversion (acre-ft./yr)
Mainstem below Abiquiu Dam	4,800	1.5	7,200	30,000
Abiquiu Creek	45	1.5	68	113
Rio del Oso	25	1.5	38	63
Arroyo Seco	25	1.5	38	63
Arroyo Frijoles/Acequia Barranco	100	1.5	150	250
Totals	4,995		7,494	30,490

\* CIR means "crop irrigation requirement", the amount of water crops need in addition to rainfall.

There are 4 community water systems in the region that are reported to serve almost 1200 people. There are 4 additional public water systems that don't serve permanent residents. It appears that over 6000 residents get their drinking water from wells at present, although the Agua Sana system under construction in Hernandez and Chamita will soon connect many people to a community system.

The Abiquiu and Chamita Fire Districts are located in our area. When they need water, timing is everything – even though they don't actually consume any appreciable quantity of water.

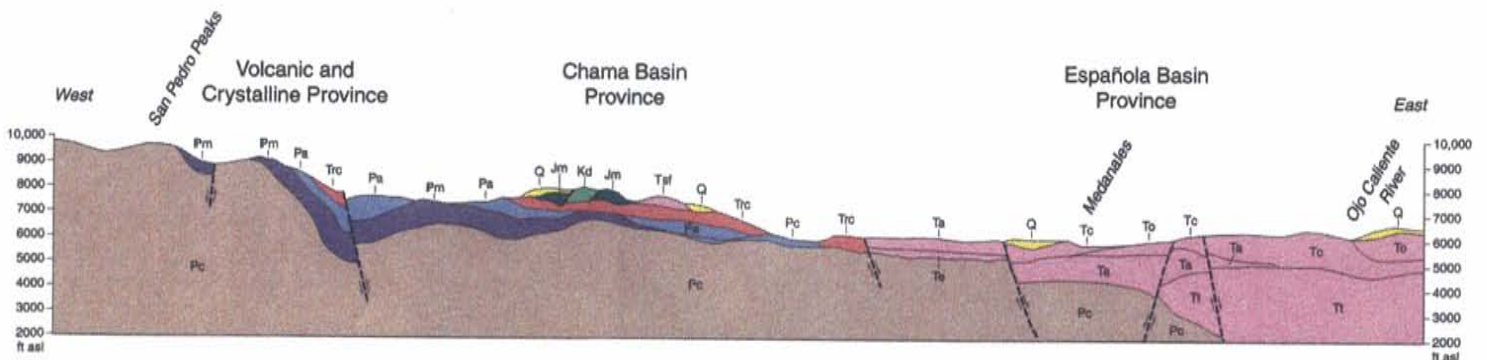
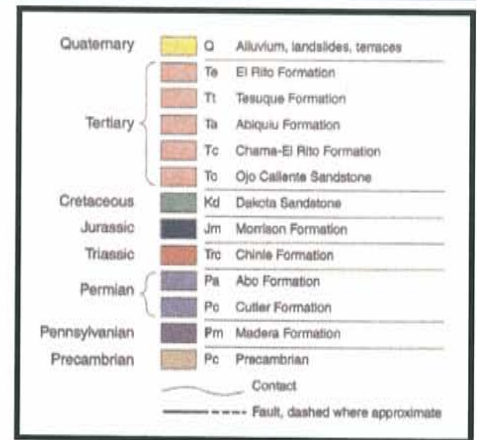
Surface and ground water are usually closely connected here. Most domestic water does come from a well or other underground source, but many aquifers in the Lower Chama watershed are shallow and dependent on surface water. In other words, the aquifers do not store very much water themselves, and water pumped from a well is usually recharged fairly quickly from stream flow. This also means that substantial pumping of wells will soon diminish the flow in streams.

Water System Name	Population	Water source
Abiquiu MDWCA	363	spring
Barranco MDWCA	75	infiltration gallery
Chamita	700	well
Chili	51	well?
Population served by community systems	1189	
Abiquiu Dam	43	well
Abiquiu Elementary School	194	well
Abiquiu Inn	65	well
Hernandez Elementary School	292	well

## Geology

How much ground water we can find is determined by the geology beneath our feet. Water seeps down through the ground into whatever spaces there are in soil, sediment, or rock. This material makes up the aquifer, or water-bearing geological formation. The more spaces there are in the aquifer material, the more water it will hold and the easier it is to get it out – and therefore the better aquifer it is. In solid rock, the only space for water is cracks in the rock, if there are any (this is why solid rock is usually a poor aquifer). At the other extreme, clean sand or gravel with lots of spaces between the grains will hold lots of water, and it will flow out easily - making for a good aquifer.

Within the Chama watershed as a whole there are three major geologic regions: crystalline volcanic rocks, Chama Basin sedimentary rocks, and more recent sedimentary fill in the Española Basin. The geologic cross section below, which extends across almost the whole southern part of the Rio Chama watershed, shows all three kinds of subsurface geology. The location of the section is shown on the map on the cover page. About the eastern half of it is located within the lower Rio Chama area.



Around Abiquiu, Chama Basin rocks (like the red and yellow cliffs of Entrada sandstone) are present; but Española Basin fill is the dominant aquifer material in most of the Lower Chama area. These formations are mostly sand, silt, and clay washed down from the Sangre de Cristo Mountains. They are usually

good aquifers, producing more reliable supplies of ground water than any other aquifer materials in the Chama watershed. Chama Basin aquifers are often relatively unproductive, and may contain dissolved minerals that make the water bad tasting or even unhealthy to drink.

## Water Quality

### Major surface water problem: *sediment resulting from soil erosion*

Sources:	Solutions:
<ul style="list-style-type: none"> <li>• Stream bank erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Protect and enhance natural vegetation to help stabilize banks</li> <li>• Make sure vegetation isn't excessively abused</li> </ul>
<ul style="list-style-type: none"> <li>• Soil loss from upland areas</li> </ul>	<ul style="list-style-type: none"> <li>• Improve grass cover</li> <li>• Build small check dams and swales to prevent gullies</li> </ul>
<ul style="list-style-type: none"> <li>• Road crossings and construction activities</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize disturbance of stream and arroyo channels</li> <li>• Provide properly designed and installed culverts</li> <li>• Don't disturb stream or arroyo banks if possible</li> <li>• Contain sediment on construction sites</li> </ul>

Reducing soil erosion saves money – and assistance is available from both State and federal governments. Increasing regulatory requirements are on the way too: the Environment Department is in the process of setting water quality standards for sediment, and we as a region will have to find ways to meet the standards.

### Major ground water problem: *septic tank effluent*

Where settlement is dense and ground water is shallow, septic tanks have contaminated water supplies, threatening peoples' health and requiring deeper wells or piping in clean water from somewhere else - providing clean water can be found. The other alternative, which may be cheaper in the long run, is to provide better wastewater treatment so that drinking water aquifers are protected from contamination in the first place. Nitrate contamination above drinking water standards has been found frequently in the Chamita area, occasionally in Hernandez and Medanales, and may well exist elsewhere.

### Emerging issues: *arsenic and uranium*

Arsenic and uranium occur naturally in parts of New Mexico, and sometimes show up in drinking water. The levels in natural ground water aren't acutely toxic, but they may increase the risk of some kinds of cancer over a lifetime of exposure. Because of this, EPA has recently announced lower allowable levels of arsenic and uranium in drinking water. Arsenic levels that exceed the new standards have been reported in the Abiquiu and Barranco areas.

## WHAT'S IN STORE FOR THE FUTURE?

Looking only at total quantities of water, there should be enough water for future population growth. However, it's not quite so simple. Most of our available water supplies are surface water - but most of our expanding water needs are for drinking water, and surface water has to be treated, pumped, stored, and piped to where it's needed. In addition, water rights would have to be transferred from agricultural to domestic uses. Reliable ground water supplies may not be located where the needs are, and ground water quality is a real problem in some areas.

We are fortunate in having relatively good surface water supplies, even though they vary a lot and are not always enough to irrigate all the fields. To preserve this water supply, we have to make sure it is put to use. To do this we need to revitalize agriculture so that the water in the acequias helps our farmers and communities support themselves, as well as keeping the fields green. Water, land, and a sustainable living from the land are all interwoven. Water is a crucial thread, but not the only thread, in the tapestry of life here in Rio Arriba that we seek to preserve, enhance, and hand on to our children and grandchildren.

# WATER

in the Gallina, Puerco de Chama and Cañones watersheds



The Rio Chama Acequias Association is collaborating with Rio Arriba County on a Regional Water Plan for the Rio Chama watershed. We are collecting information about how much water is available, what we use it for, and how much we'll need in the future.

This fact sheet summarizes information about water along the western Rio Chama below El Vado Reservoir, including the Rio Gallina, Rio Puerco de Chama, and Cañones-Polvadera watersheds. It is intended to help understand more about how much water we have and how water affects our lives. We hope it will help residents make a difference in both regional water planning and county general planning.

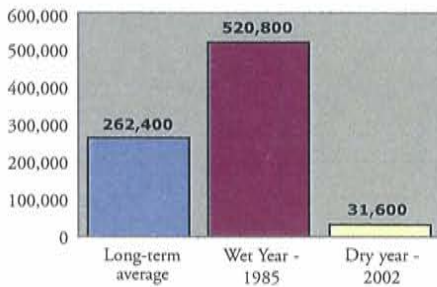
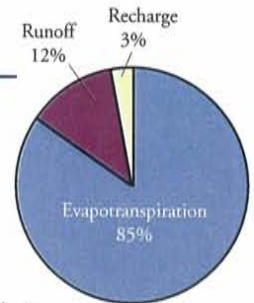


Most of what we know about water in the Rio Chama is really based on estimates and not on direct measurements. So far we can't actually measure most of the things we want to know: streamflow (in most tributaries), water

use, return flows, and so on – so these all have to be estimated. Estimates are based on assumptions and calculations that may not be completely accurate, but it's the best information we have.

## Water Supply

All the water we have ultimately comes from precipitation. Even the deepest ground water is just rain or snowmelt stored underground. The water in streams, and ground water recharge, are a small part of the total precipitation that falls on our watershed. The chart to the right illustrates what happens to the precipitation we get: about 85% evaporates or is used by vegetation pretty much where it falls, 12% or so runs off in streams, and 3% or less recharges ground water.

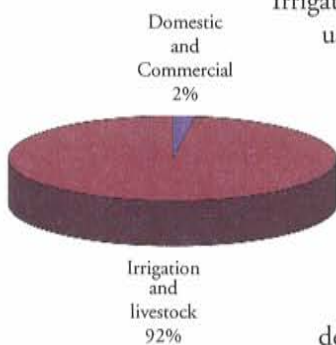


Precipitation (and everything else about water in New Mexico) is extremely variable. There are no stream gages on the Rio Gallina, Rio Puerco de Chama, or Cañones Creek; but streamflow at the La Puente gage on the Rio Chama shows how variable runoff can be. Flow at La Puente was less than 32,000 acre-feet last year (2002), but it was more than 520,000 acre-feet in a wet year (1985). The long-term average is about 262,000 acre-feet. In other words, in 2002 there was only 6% of the water there was in the wettest year, and less than 12% of average. The driest year on record before this one was 1977, with runoff of 45,000 acre-feet. The chart to the left shows this very graphically. Flow on any given tributary probably varies at least as much.

We have no accurate way to know how much water flows down tributary streams into the Chama. There were stream gages on the Rio Brazos and Canjilon Creek from 1913 to 1915, but since then we have no data. Adapting a USGS method, flows can be estimated, but not with a great deal of certainty. The table to the right summarizes the range of estimates for average flows in the major tributaries in this area. Just like the La Puente figures, flows will vary far outside these ranges in wet and dry years.

Tributary	Avg. flow estimate (acre-feet per year)
Rio Gallina	21,000 – 42,000
Rio Puerco de Chama	31,000 – 62,000
Cañones Creek	22,000 – 44,000

## Water Demand and Uses



Irrigation accounts for about 98% of all the water we use below Abiquiu, with domestic and commercial uses making up 2%. Not all irrigation diversions (and no return flows) are measured, so water use has to be estimated from the total acreage irrigated and calculations about how much water crops need. Most of the water diverted onto the fields eventually returns either to streams or to ground water – the State Engineer estimates that 65% to 75% of the water delivered becomes return flow. In other words, we have to divert three or four times as much water as the crops actually need to be sure of getting enough water to all the fields.

The table at the right summarizes estimated irrigation demand if all irrigated land were adequately watered.

But of course the fields are not always adequately watered. Estimates of historical supply, or the amount of needed irrigation water actually supplied, have not been done for this area but we all know that in the dry years not everything gets watered enough.

Stream reach or tributary	Irrigated acreage	CIR* (ft/yr)	Depletion (acre-ft./yr)	Diversion (acre-ft./yr)
Rio Gallina	1,061	1.15	1,220	5,084
Rio Puerco de Chama	2,086	1.5	3,129	13,038
Cañones Creek	355	1.24	440	1,834
<b>Totals</b>	<b>3,502</b>		<b>4,789</b>	<b>19,956</b>

\* CIR means "crop irrigation requirement", the amount of water crops need in addition to rainfall.

Domestic and commercial water use, as we saw on the last page, makes up a about 2% of total water use. Our total population in the Gallina-Puerco de Chama-Cañones area is about 1200 people. Total domestic water consumption is about 106 acre-feet per year. Just like irrigation diversions, there is substantial return flow from domestic uses, mainly effluent from septic tanks – and this can bring some water quality problems with it.

There are 5 community water systems in the region that are reported to serve almost 375 people. There are 3 additional public water systems that don't serve permanent residents. It appears that about 825 residents get their drinking water from private wells.

The Coyote and part of the Regina Fire Districts are located in our area. When they need water, timing is everything – even though they don't actually consume any appreciable quantity of water.

Surface and ground water are often closely connected here. Most domestic water does come from a well or other under-

## Geology

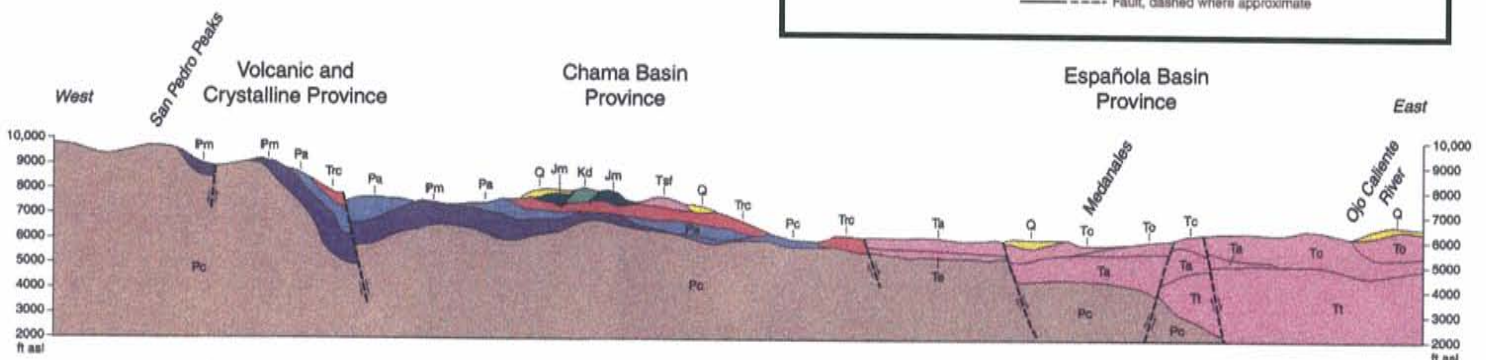
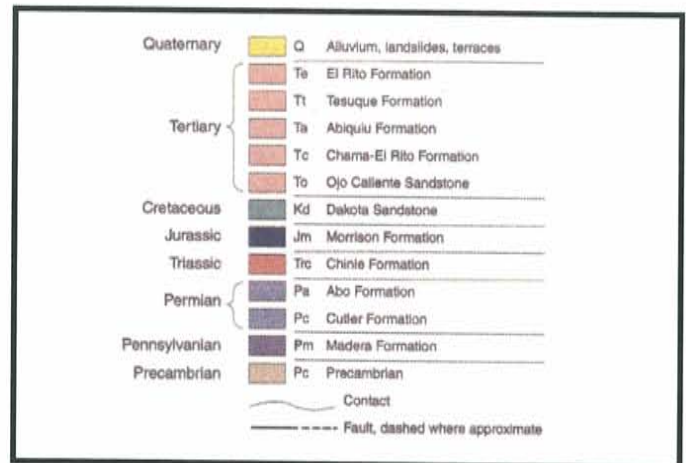
How much ground water we can find is determined by the geology beneath our feet. Water seeps down through the ground into whatever spaces there are in soil, sediment, or rock. This material makes up the aquifer, or water-bearing geologic formation. The more spaces there are in the aquifer material, the more water it will hold and the easier it is to get it out – and therefore the better aquifer it is. In solid rock, the only space for water is cracks in the rock, if there are any (this is why solid rock is often a poor aquifer). At the other extreme, clean sand or gravel with lots of spaces between the grains will hold lots of water, and it will flow out easily – making for a good aquifer.

Within the Chama watershed as a whole there are three major geologic regions: crystalline volcanic rocks, Chama Basin sedimentary rocks, and more recent sedimentary fill in the Española Basin. The geologic cross section below, which extends across almost the whole southern part of the Rio Chama watershed, shows all three kinds of subsurface geology. The location of the section is shown on the map on the cover page. About the eastern half of it is located within the Rio Puerco and Cañones Creek watersheds.

Water System Name	Population	Water source
<i>Arroyo de Agua MDWCA</i>	60	well
<i>Christ in the Desert Monastery</i>	40	infiltration
<i>Coyote MDWCA</i>	53	well
<i>Gallina MDWCA</i>	120	well
<i>Youngsville MDWCA</i>	100	3 wells
<i>Total served by community systems</i>	373	
USFS Coyote Ranger Station	45	
Coronado High School	300	
Coyote Elementary School	94	

ground source, but alluvial aquifers in particular are shallow and dependent on surface water. In other words, the aquifers do not store very much water themselves, and water pumped from a well is usually recharged fairly quickly from stream flow. This also means that substantial pumping of wells will diminish the flow in streams, sometimes quickly.

Most wells in this area are drilled into either shallow alluvial aquifers or Chama Basin deposits (like the Chinle, Morrison, Dakota, or Mancos formations). Alluvial aquifers in general are highly permeable and transmit water well, but they are shallow, don't store much water, and are vulnerable to drought. Chama Basin aquifers often do not transmit much water and are more likely to have water quality problems like sulfur or even dissolved metals.



# Water Quality

## Major surface water problem: *sediment resulting from soil erosion*

### Sources:

- Stream bank erosion
- Soil loss from upland areas
- Road crossings and construction activities

### Solutions:

- Protect and enhance natural vegetation to help stabilize banks
- Make sure vegetation isn't excessively abused
- Improve grass cover
- Build small check dams and swales to prevent gullies
- Minimize disturbance of stream and arroyo channels
- Provide properly designed and installed culverts
- Don't disturb stream or arroyo banks if possible
- Contain sediment on construction sites

Reducing soil erosion saves money – and assistance is available from both State and federal governments. Increasing regulatory requirements are on the way too: the Environment Department is in the process of setting water quality standards for sediment, and we as a region will have to find ways to meet the standards.

## Major ground water problem: *septic tank effluent*

In some parts of the Chama valley septic tanks have contaminated water supplies, and clean water has had to be brought in from somewhere else – providing clean water can be found. The other alternative, which may be cheaper in the long run, is to provide better wastewater treatment so that drinking water aquifers are protected from contamination in the first place. Contamination above drinking water standards has not been reported in the western part of the Chama watershed, but many wells have not been tested. Levels of nitrates (a good indicator of septic tank contamination) in public water systems are generally low, which is a good sign. However, where lots of septic systems are clustered together, some septage contamination is almost inevitable

## Emerging issues: *arsenic and uranium*

Arsenic and uranium occur naturally in parts of New Mexico, and sometimes show up in drinking water. The levels in natural ground water aren't acutely toxic, but they may increase the risk of some kinds of cancer over a lifetime of exposure. Because of this, EPA has recently announced lower allowable levels of arsenic and uranium in drinking water. Arsenic levels that may be a problem under the new standards have been reported in the Arroyo del Agua and Youngsville areas.

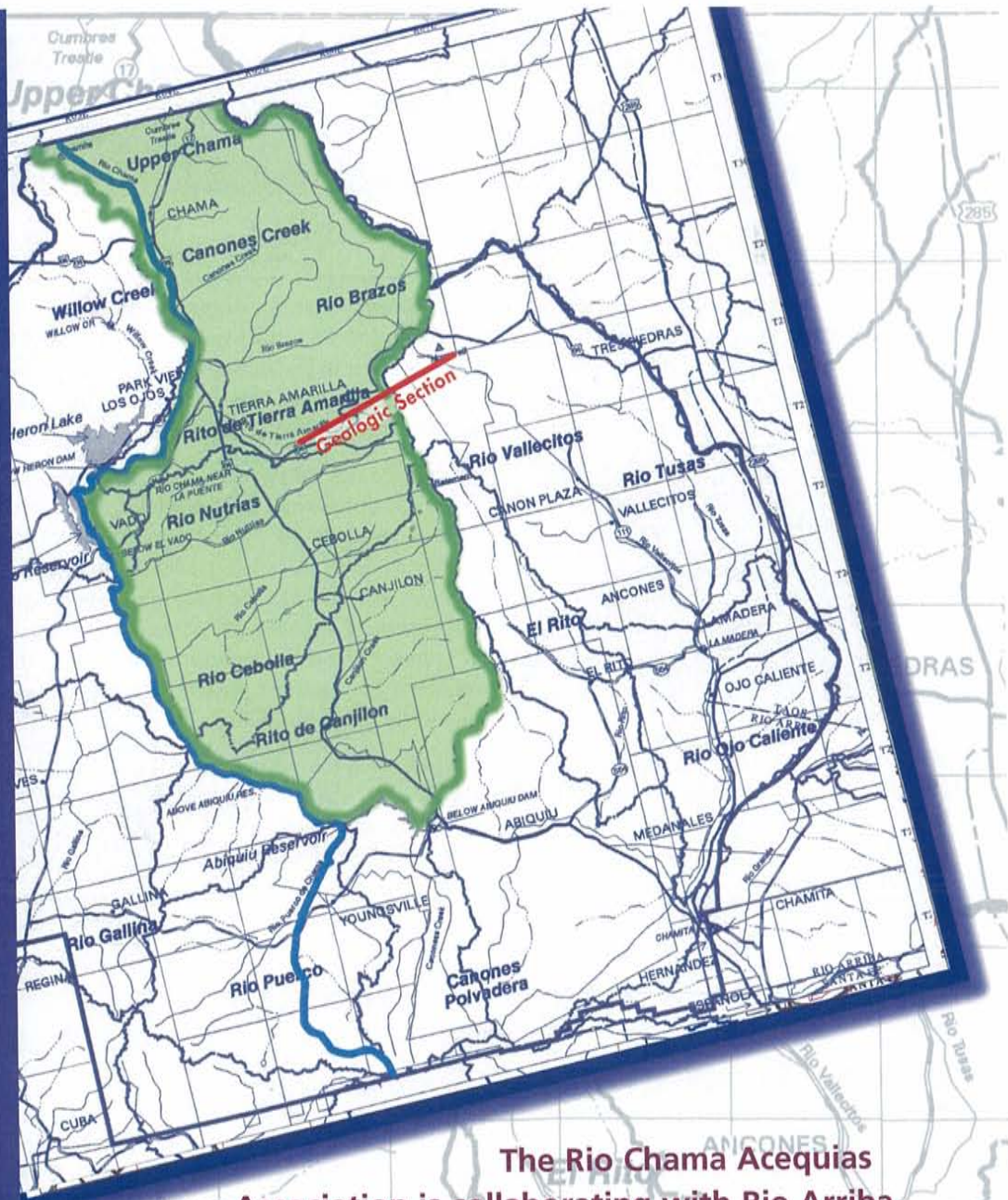
## WHAT'S IN STORE FOR THE FUTURE?

Looking only at total quantities of water, it seems like there should be plenty – but it's not quite that simple. Most of our available supplies are surface water but most of our domestic and community needs are served by ground water, which is often severely limited. To use surface water, it has to be treated, pumped, stored, and piped to where it's needed. In addition, water rights would have to be transferred from agricultural to domestic uses. Reliable ground water supplies are not always located where the needs are, and ground water quality is a real problem in some areas.

We are fortunate in having relatively good surface water supplies, even though they vary a lot and are not always enough to irrigate all the fields. To preserve this water supply, we have to make sure it's put to use – and to do this we need to revitalize agriculture so that the water in the acequias helps our farmers and communities support themselves, as well as keeping the fields green. Water, land, and a sustainable living from the land are all interwoven. Water is a crucial thread, but not the only thread, in the tapestry of life here in Rio Arriba that we seek to preserve, enhance, and hand on to our children and grandchildren.

# WATER

in the upper Rio Chama watershed



The Rio Chama Acequias Association is collaborating with Rio Arriba County in developing a Regional Water Plan for the Rio Chama and its tributaries. We are collecting information about how much water is available, what we use it for, and how much we'll need for the future.

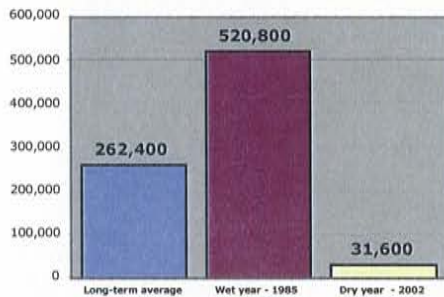
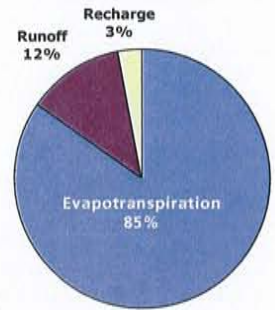
This fact sheet summarizes information about the upper Rio Chama, including Cañones Creek, Rio Brazos, Rito de Tierra Amarilla, Rio Nutrias, Rio Cebolla, and Canjilon Creek. Hopefully it will help us understand more about how much water we have and how water affects our lives. We hope it will help residents participate more effectively in both regional water planning and County-wide general planning.



Most of what we know about water in the Rio Chama is based on estimates and not on direct measurements. As of now we can't actually measure most of the things we want to know: streamflow (in most tributaries), water use, return flows, and so on – so these all have to be estimated. These estimates are based on assumptions and calculations, so they may not be completely accurate, but they are the best information we have.

## Water Supply

The ultimate source of all the water we have is precipitation. Even the deepest ground water is just rain or snowmelt stored underground. Water in streams and ground water recharge are a fairly small fraction of the total precipitation that falls on our watersheds. The chart to the right illustrates what happens to the precipitation we get: about 85% evaporates or is used by vegetation, 12% runs off in streams, and 3% or less recharges ground water supplies.



A year like this emphasizes that precipitation and everything else about water in New Mexico is extremely variable. Streamflow at the La Puente gage, for example, was less than 32,000 acre-feet this year, but it was more than 520,000 acre-feet in a wet year (1985). The long-term average is about 262,000 acre-feet. In other words, this year there was only 6% of the water there was in the wettest year, and less than 12% of average. The driest year on record before this one was 1977, with runoff of 45,000 acre-feet. The chart to the left shows this very graphically.

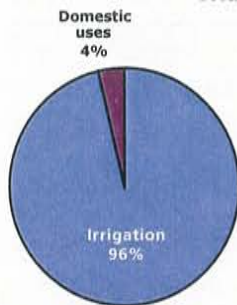
We have no accurate way to know how much water flows down tributary streams into the Chama. There were stream gages on the Rio Brazos and Canjilon Creek from 1913 to 1915, but since then we have no data. Flows can be estimated, but not with a great deal of certainty. The table to the right summarizes the range of estimates for average flows in the major tributaries. Just like the La Puente figures, flows will vary far outside these ranges in wet and dry years.

There are a lot of diversions for irrigation in the upper Chama tributaries, many of them above the La Puente gage. Irrigation water use above La Puente is estimated to be nearly 10,000 acre-feet per year.

Tributary	Avg. flow estimate (acre-feet per year)
Rio Chama above Canones Cr.	67,000 - 105,000
Canones Creek	4,000 - 20,000
Rio Brazos	90,000 - 122,000
Rito de Tierra Amarilla	10,000 - 15,000
Rio Nutrias	9,000 - 13,000
Rio Cebolla	5,000 - 7,000
Canjilon Creek	10,000 - 20,000

## Water Demand and Uses

Irrigation accounts for almost all the water we use in this area. Irrigation water isn't actually measured, so what's used has to be estimated from the total acreage irrigated and calculations about how much water crops need. Most of the water diverted into acequias eventually returns either to streams or to ground water – the State Engineer estimates that about 2/3rds to 3/4ths of the water diverted returns to either surface or ground water. In other words, we have to divert three or four times as much water as the crops actually need to be sure of getting enough water to all the fields.



The table below summarizes estimated irrigation demand if all irrigated land were adequately watered. All figures are approximate.

But of course the fields aren't always adequately watered. Estimates of historical supply, or the amount of needed irrigation water actually supplied, have not been done for this area but we all know there are wet and dry years, and in the dry years not everything gets watered.

Stream Reach or Tributary	Irrigated Acreage	Crop irrigation req'mt. (ft/yr)	Estimated depletion (af/yr)	Estimated diversion (af/yr)
Rio Chama mainstream	3,100	0.88	2,700	8,000 - 11,000
Canones Creek	1,700	0.96	1,600	4,900 - 6,800
Rio Brazos	3,700	0.96	3,500	10,000 - 15,000
Rito de Tierra Amarilla	1,400	0.92	1,300	3,900 - 5,400
Rio Nutrias	1,400	1.01	1,400	4,300 - 5,900
Rio Cebolla	2,100	0.89	1,900	5,600 - 7,800
Canjilon Creek	1,900	1.01	1,900	5,800 - 8,000
<b>TOTAL</b>	<b>15,300</b>		<b>14,300</b>	<b>42,500 - 60,200</b>



Domestic water use, in comparison, makes up only about 4% of total water use, as illustrated in the chart on the previous page. The table to the right shows total estimated domestic water use, from both private wells and community systems. Just like irrigation diversions, there is substantial return flow from domestic uses too, mainly effluent from septic tanks – and this can bring some water quality problems with it.

There are 9 community water systems in the region from Chama to Canjilon that are reported to serve about 3,260 people. There are also 10 more public water systems that don't serve permanent residents.

The Tierra Amarilla, Brazos Canyon, and Laguna Vista fire districts are located within our watershed area. When they need water, timing is everything – even though they don't regularly use much water.

Surface and ground water are usually closely connected here. Most domestic water does come from a well or other underground source, but most usable aquifers in the upper Chama watershed are shallow and dependent on surface water. In other words, the aquifers do not store very much water themselves, and water pumped from a well is usually recharged fairly quickly from stream flow. This also means that substantial pumping of wells will soon diminish the flow in streams.

## Geology

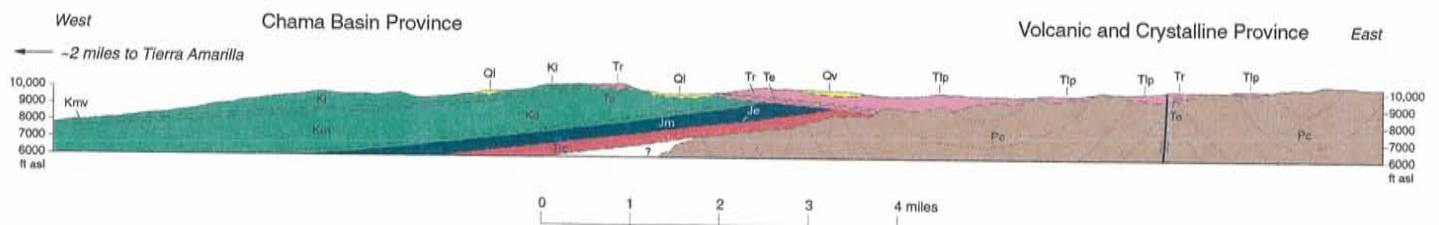
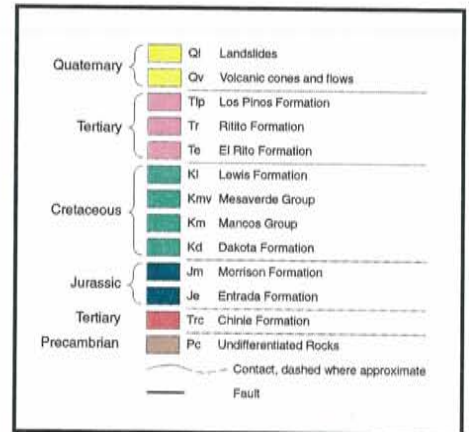
How much ground water we can find is determined by the geology beneath our feet. Water seeps down through the ground into whatever spaces there are in soil or rock. This material makes up the aquifer, or water-bearing geological formation. The more spaces there are in the aquifer material, the more water it will hold and the easier it is to get it out – and therefore the better aquifer it is. In solid rock, the only space for water is cracks in the rock, if there are any (this is why solid rock is often a poor aquifer). At the other extreme, clean sand or gravel with lots of spaces between the grains will hold lots of water, and it will flow out easily – making for a good aquifer.

The geology of the region from Chama south to Canjilon consists primarily of Chama basin sediments, as shown in the cross section below. The location of this cross section is shown on the map on the first page. However, the Brazos bluffs, for instance, or the Cañones box, are dramatic illustrations of the solid, igneous rock of the Tusas Mountains that form the eastern boundary of the Chama basin.

Watershed Area	Population	Diversion (pumping) af/yr	Depletion (af/yr)
Chama, Lumberton	1,680	497	294
Brazos, Los Ojos, Rutherford	548	122	72
Tierra Amarilla, El Vado, Ensenada, La Puente, Nutrias	753	232	137
Cebolla, Alire	96	29	17
Canjilon	377	96	57
<b>TOTAL</b>	<b>3,454</b>	<b>976</b>	<b>577</b>

Public Water Supply Systems		
Water System Name	Population	Water Source
<i>Chama MDWCA</i>	1250	<i>infiltration</i>
<i>Brazos MDWCA</i>	416	<i>well</i>
<i>Los Ojos MDWCA</i>	190	<i>2 wells</i>
<i>Ensenada MDWCA</i>	220	<i>well</i>
<i>Plaza Blanca MDWCA</i>	43	<i>well &amp; infiltration</i>
<i>Rutherford MDWCA</i>	71	<i>infiltration</i>
<i>Tierra Amarilla MDWCA</i>	500	<i>3 wells</i>
<i>Cebolla MDWCA</i>	200	<i>well &amp; infiltration</i>
<i>Canjilon MDWCA</i>	370	<i>spring</i>
El Alamo Cafe	65	well
Clinica del Pueblo	40	well
Corkin's Lodge	85	well
Escalante High School	200	well
Rio Arriba County Detention Ctr.	60	well
Parkview Fish Hatchery	45	spring
Echo Amphitheatre	205	well
El Vado Lake Resort	90	well
Ghost Ranch Conference Center	15	2 wells
Ghost Ranch museum	300	well

*Community systems in italics*  
 Population served by community systems 3260



Chama Basin deposits are mainly sandstone and shale in the Chinle, Morrison, Dakota, and Mancos formations. Aquifers in these rocks typically have low to moderate permeability, and generally don't yield large quantities of water. They often have water quality problems like bad taste or odors as well as excessive dissolved minerals and sometimes metals. Alluvial deposits often

fill the valley bottoms over Chama Basin deposits and serve as aquifers for many communities. These aquifers are highly permeable and transmit large amounts of water, but they are usually shallow and don't cover a large area, so they are vulnerable to drought and many go dry if they are not supplied by perennial streams.

## Water Quality

### Major surface water problem: Sediment resulting from soil erosion

Sources:	Solutions:
Stream bank erosion	<ul style="list-style-type: none"> <li>• Protect and enhance natural vegetation to help stabilize banks</li> <li>• Make sure vegetation isn't excessively abused</li> <li>• Improve grass cover</li> <li>• Build small check dams and swales to prevent gullies</li> <li>• Minimize disturbance of stream and arroyo channels</li> <li>• Provide properly designed and installed culverts</li> <li>• Don't disturb stream or arroyo banks if possible</li> <li>• Contain sediment on construction sites</li> </ul>
Soil loss from upland areas	
Road crossings and construction activities	

Reducing soil erosion saves money – and assistance is available from both State and federal governments. Increasing regulatory requirements are on the way too: the Environment Department is in the process of setting water quality standards for sediment, and we as a region will have to find ways to meet the standards.

### Major ground water problem: Septic tank effluent

In some parts of the Chama valley septic tanks have contaminated water supplies, and clean water has had to be brought in from somewhere else – providing clean water can be found. The other alternative, which may be cheaper in the long run, is to provide better wastewater treatment so that drinking water aquifers are protected from contamination in the first place. Contamination above drinking water standards has not been reported in the upper Chama area, but not every well has been tested. Levels of nitrates (a good indicator of septic tank contamination) in public water systems are low, which is a good sign. However, where lots of septic systems are clustered together, some septage contamination is almost inevitable.

### Emerging issues: Arsenic and Uranium

Arsenic and uranium occur naturally in parts of New Mexico, and sometimes show up in drinking water. The levels in natural ground water aren't acutely toxic, but they may increase the risk of some kinds of cancer over a lifetime of exposure. Because of this, EPA has recently announced lower allowable levels of arsenic and uranium in drinking water. In this area, the only reported arsenic levels that exceed the new standards are in the Cebolla area.

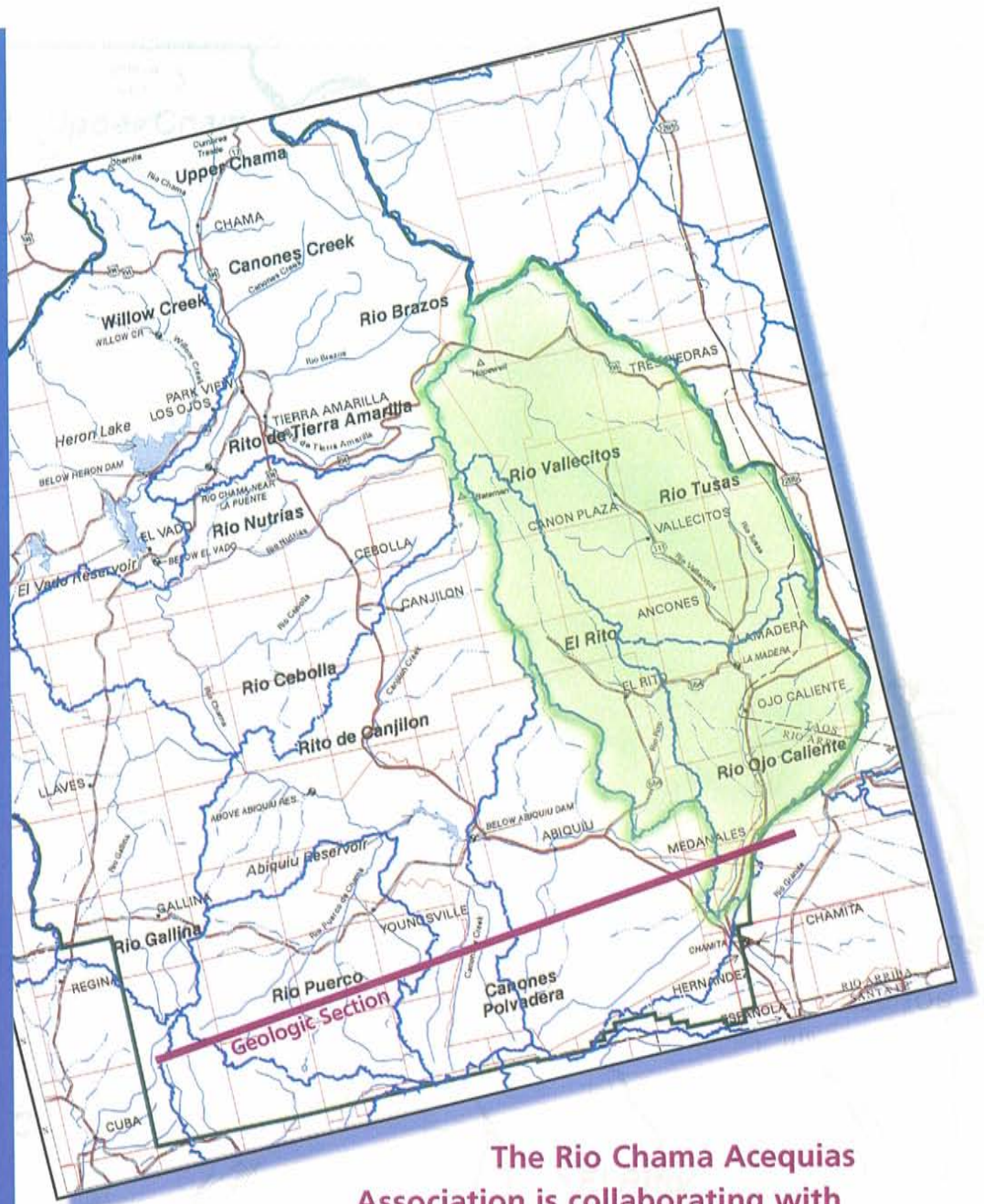
## WHAT'S IN STORE FOR THE FUTURE

Looking only at total quantities of water, there should be more than enough water for future population growth. However, it's not quite so simple. Most of our available water supplies are surface water – but most of our expanding water needs are for drinking water, and surface water has to be treated, pumped, stored, and piped to where it's needed. In addition, water rights would have to be transferred from agricultural to domestic uses. Reliable ground water supplies may not be located where the needs are, and ground water quality is a real problem in some areas.

We are fortunate in having significant surface water irrigation supplies, even though they vary a lot and are not always enough. To save this water supply, we have to make sure it is put to use. We need to revitalize agriculture so that the water in the acequias not only keeps the fields green, it helps our farmers and communities support themselves. Water, land, and a sustainable living from the land are all interwoven. Water is a crucial thread, but not the only thread, in the tapestry of life in Rio Arriba that we seek to preserve, enhance, and hand on to our children and grandchildren.

# WATER

in the Ojo Caliente and El Rito watersheds



The Rio Chama Acequias Association is collaborating with Rio Arriba County in developing a Regional Water Plan for the Rio Chama and its tributaries. We are collecting information about how much water is available, what we use it for, and how much we'll need for the future. This fact sheet summarizes information about the Ojo Caliente and El Rito watersheds (including the Rio Tusas and Rio Vallecitos). Hopefully it will help us understand more about how much water we have and how water affects our lives. We hope it will help residents participate more effectively in both regional water planning and County-wide general planning.



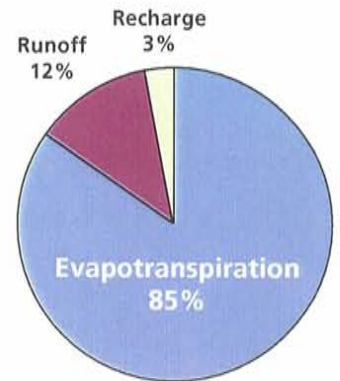
Most of what we know about water in the Rio Chama is actually based on estimates and not on direct measurements. As of now we can't measure most of the things we want to know: streamflow (in most tributaries), water use, return flows, and so on – so these all have to be estimated. Estimates are based on assumptions and calculations, so they may not be completely accurate, but they are the best information we have.

A year like this reminds us that precipitation and everything else about water in New Mexico is extremely variable. Streamflow in the Rio Ojo Caliente, for example, was less than 10,000 acre-feet in a dry year (1977), and almost 150,000 acre-feet in a wet year (1941). The long-term average at La Madera is about 51,000 acre-feet. In other words, runoff in the driest year was only 7% of runoff in the wettest year, and less than 20% of average. This year has been even drier so far.

## Water Supply

The ultimate source of all the water we have is precipitation. Even the deepest ground water is just rain or snowmelt stored underground. Water in streams and ground water recharge are a fairly small fraction of the total precipitation that falls on our watersheds. The chart to the right illustrates what happens to the precipitation we get: about 85% evaporates or is used by vegetation, 12% runs off in streams, and 3% or less recharges ground water supplies.

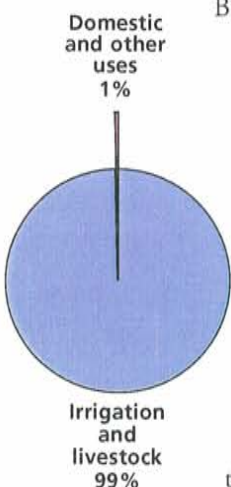
We have a better idea how much runoff there is in the Rio Ojo Caliente and El Rito than in most Chama tributaries, because there has been a stream gage near La Madera since 1932, and there was one near El Rito from 1931 to 1950. The average flow in El Rito at the gage was about 13,000 acre-feet per year, and in the Ojo Caliente it has been about 51,000 acre-feet per year. Since there are about 3,500 irrigated acres above the La Madera gage that probably use about 5,000 acre-feet of irrigation water if they're fully watered, the total average flow at La Madera if nothing were used for irrigation would be about 56,000 acre-feet per year.



## Water Demand and Uses

Almost all the water we use in the Ojo Caliente and El Rito areas is for irrigation. Since irrigation water use isn't actually measured, it has to be estimated from acreage and crop water needs. About 3/4ths of the water diverted into acequias eventually returns to streams or ground water, according to State Engineer estimates. In other words, we have to divert about 4 times as much water as the crops actually need, to be sure of getting enough water to the fields. The table to the right summarizes the estimated irrigation demand if all irrigated land were adequately watered.

	Acres irrigated	Diversion (acre-ft./yr.)	Depletion (acre-ft./yr.)
El Rito	2600	18,000	4350
Ojo Caliente below La Madera	850	6900	1650
Tio Tusas	1900	12,500	3000
Rio Vallecitos	1400	9400	2250
Ojo Caliente total	4150	28,800	6900



But of course the fields are not always adequately watered. In fact, State Engineer staff estimate that available water in the Rio Ojo Caliente below La Madera has historically supplied only 63% of total irrigation demand, while El Rito supplies about 70%. Some years are worse than others, and the shortages generally get worse downstream.

Domestic water use, in comparison, makes up only 1% of total water use as illustrated in the chart to the left. The 10 community water systems in El Rito and Ojo Caliente communities serve about 1,675 people, not counting non-domestic systems like schools and restaurants. Approximately 800 people get water from their own wells. The next table shows total estimated domestic water use, from both private wells and community systems. Just like irrigation diversions, there is substantial return flow from domestic uses too, mainly effluent from septic tanks – and this can bring some water quality problems with it.

Watershed	Population	Diversion (pumping) af/yr	Depletion (af/y)
El Rito area	1,114	140	40
Ojo Caliente area	1,093	100	30

These aquifers are vulnerable to drought because they are shallow and do not store much water, so communities dependent on them may experience water shortages. Fracture systems in solid crystalline bedrock are not generally reliable aquifers even though they may be very productive at times.

Downstream of about El Rito or La Madera, the bedrock dips much more deeply below the land surface into the Espanola Basin. This deep bedrock valley has filled up over millions of years with sedimentary deposits of sands, silts, and clays. These deposits are generally permeable, and provide the most reliable water in the entire Rio Chama watershed.

## Water Quality

### Major surface water problem: sediment from soil erosion

#### Sediment Sources:

- Stream bank erosion
- Soil loss from upland areas
- Road crossings and construction activities

#### Solutions:

- Protect and enhance natural vegetation to help stabilize banks
- Make sure vegetation isn't excessively abused
- Improve grass cover
- Build small check dams and swales to prevent gullies
- Minimize disturbance of stream and arroyo channels
- Provide properly designed and installed culverts
- Don't disturb stream or arroyo banks if possible
- Contain sediment on construction sites

Reducing soil erosion saves money – and assistance is available from both State and federal governments. Increasing regulatory requirements are on the way too: the Environment Department is in the process of setting water quality standards for sediment, and we as a region will have to find ways to meet the standards.

### Major ground water problem: septic tank effluent

In some other parts of the Chama valley septic tanks have contaminated water supplies, and clean water has had to be brought in from somewhere else – providing clean water can be found. The other alternative, which may be cheaper in the long run, is to provide better wastewater treatment so that drinking water aquifers are protected from contamination in the first place. Contamination above drinking water standards has not been found in the El Rito or Ojo Caliente areas; but not every well has been tested. Levels of nitrates (a good indicator of septic tank contamination) in public water systems are low, which is a good sign.

### Emerging issues: arsenic and uranium

Arsenic and uranium occur naturally in parts of New Mexico, and sometimes show up in drinking water. The levels in natural ground water aren't acutely toxic, but they may increase the risk of some kinds of cancer over a lifetime of exposure. Because of this, EPA has recently announced lower allowable levels of arsenic and uranium in drinking water, and some water systems in the Chama valley may have difficulty meeting the new standard. In this area, the only reported arsenic or uranium levels that may exceed the new standards are in the vicinity of Ojo Caliente.

## WHAT'S IN STORE FOR THE FUTURE?

Looking only at total quantities of water, there should be more than enough water for future population growth. However, it's not quite so simple. Most of our available water supplies are surface water – but most of our expanding water needs are for drinking water, and surface water has to be treated, pumped, stored, and piped to where it's needed. In addition, water rights would have to be transferred from agricultural to domestic uses. Reliable ground water supplies may not be located where the needs are, and ground water quality is a real problem in some areas.

We are fortunate in having significant surface water irrigation supplies, even though they are not always enough. To preserve this water supply, we have to make sure it is put to use. We need to revitalize agriculture so that the water in the acequias not only keeps the fields green, it helps our farmers and communities support themselves. Water, land, and a sustainable living from the land, are all interwoven. Water is a crucial thread, but not the only thread, in the tapestry of life in Rio Arriba that we seek to preserve, enhance, and hand on to our children and grandchildren.

The El Rito and Vallecitos fire districts are also located within our watershed area. When they need water, timing is everything – even though they don't regularly use any appreciable quantity of water compared to other uses.

*In our area surface and ground water are closely connected. Most domestic water does come from a well or other underground source, but most aquifers in the Ojo Caliente and El Rito watersheds are shallow and closely connected to surface water. In other words, the aquifers do not store very much water themselves, and water pumped from a well is usually recharged fairly quickly from stream flow. This means that substantial pumping of wells will soon diminish the flow in streams.*

## Public Water Supply Systems

WATER SYSTEM NAME	POPULATION	WATER SOURCE
<i>Archuleta Mobile Home Park</i>	60	<i>well</i>
<i>Canon Plaza MDWCA</i>	25	<i>well</i>
<i>Capulin MDWCA</i>	165	<i>well</i>
El Alamo Café	65	well
<i>El Rito Canyon MDWCA</i>	300	<i>well &amp; infiltration</i>
El Rito Elementary School	140	well
<i>El Rito MDWCA</i>	363	<i>well</i>
<i>La Madera MDWCA</i>	36	<i>2 wells</i>
Mesa Vista High School	500	well
Northern New Mexico Comm. Coll.	125	spring
<i>Ojo Caliente MDWCA</i>	250	<i>2 wells</i>
Ojo Caliente Mineral Springs	50	well
<i>Placitas MDWCA</i>	320	<i>2 wells</i>
<i>South Ojo Caliente MDWCA</i>	60	<i>2 wells</i>
<i>Vallecitos MDWCA</i>	96	<i>infiltration</i>

*Community systems in italics*

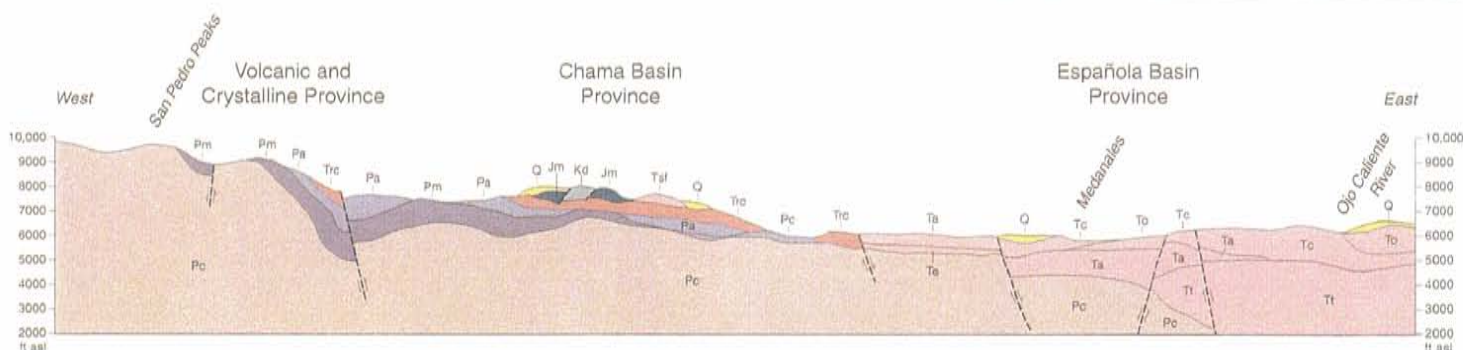
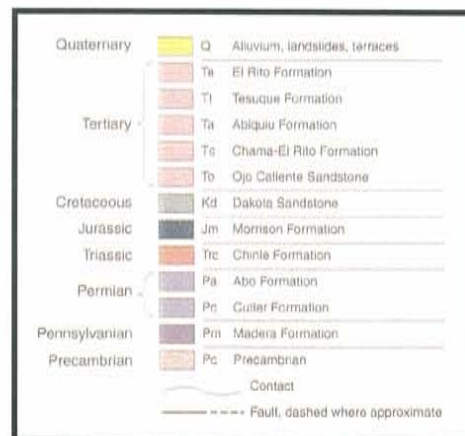
*Population served by community systems*

1,675

## Geology

How much ground water we can find is determined by the geology beneath our feet. Water seeps down through the ground into whatever spaces there are in soil, sediment, or rock. This material makes up the aquifer, or water-bearing geological formation. The more spaces there are in the aquifer material, the more water will it will hold and the easier it is to get it out – and therefore the better aquifer it is. In solid rock, the only space for water is cracks in the rock, if there are any (this is why solid rock is often a poor aquifer). At the other extreme, clean sand or gravel with lots of spaces between the grains will hold lots of water, and it will flow out easily – making for a good aquifer.

Within the Chama watershed as a whole there are three major geologic provinces with different kinds of rock: crystalline volcanic rocks, Chama Basin sedimentary rocks, and sedimentary fill in the Española Basin. The geologic cross section below,



which extends across almost the whole southern part of the Rio Chama watershed, shows all three kinds of subsurface geology. The eastern edge of it crosses the El Rito and Ojo Caliente valleys. The location of the section is shown on the map on the cover page.

The geology above El Rito and La Madera is dominated by crystalline, igneous rocks that are generally poor aquifer materials. In valley bottoms there are sedimentary deposits that are more permeable, but usually shallow. These deposits are the primary aquifer for mountain communities.



photos by J. Fidel Trujillo



# Regional water planning for the Rio Chama watershed

In 1995 the New Mexico Interstate Stream Commission contracted with the Rio de Chama Acequias Association, and Rio Arriba County as fiscal agent, to write a water plan for the watershed of the Rio Chama. Our watershed includes all the land where rain or snowmelt will run into the Rio Chama or any of its tributary streams, and covers over 2 million acres. We are one of 16 planning regions in New Mexico.

In the years that followed, many discussions about the water plan have taken place: at meetings of acequia commissioners and parcientes; at Rio Arriba County General Plan meetings; at public meetings around the Rio Chama watershed

specifically for regional water planning; and in meetings with key stakeholders such as elected officials, Rio Arriba County staff, water system operators, and acequia association officials. We have collected all the information we could find, and a draft Plan has been written that answers three basic questions:

*How much water is available?*

*How much water do we use now, and how much will we need in the future?*

*What's the best way to make sure we'll have enough water for our future needs?*

## What we've learned

*We've learned some things in several years of research, and these give us some essential background information about water in our region.*

Everything about water here – how much snow and rain we get, how much flows down the rivers, and how much we use – varies enormously from one year to the next. All the figures we mention below are averages over the past 30 years or more, but each year is very different.

90 percent of the runoff from the Rio Chama watershed, an average of 376,000 acre-feet per year, leaves the region and flows down the Rio Grande. Nevertheless, we have shortages of both irrigation and domestic water throughout the region.

Water we use, or evaporate by intentional human activities like agriculture or home use, is called "depletion". Within the whole watershed, our depletion is 26,700 acre-feet per year. About 25,100 acre-feet is depleted for irrigated agriculture or livestock, and about 1,600 acre-feet is depleted for domestic and commercial uses.

Agricultural water needs will probably remain constant, while domestic and commercial needs will at least double over the next 40 years.

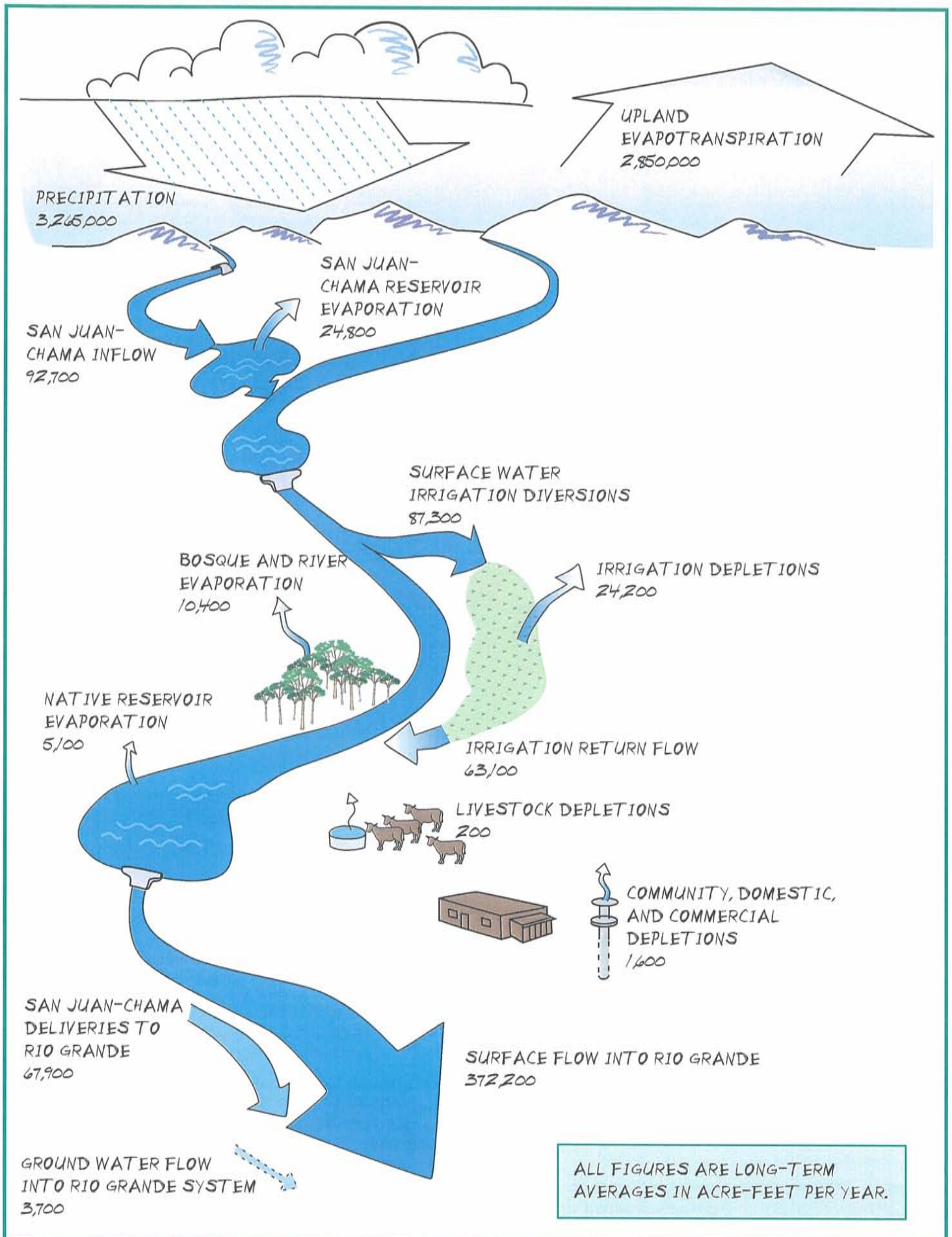
The San Juan-Chama Project has added an average of 92,700 acre-feet per year to the Rio Chama and delivered about 67,900 acre-feet to downstream users, but almost no San Juan-Chama water can be used within the region, because water rights are held elsewhere.

Reservoir evaporation is a significant "use" of water, depleting over 5,000 acre-feet of native water and nearly 25,000 acre-feet of San Juan-Chama Project water every year.

About 5 percent of our total depletions come from ground water, but this provides nearly 90 percent of all domestic and commercial water for our 12,250 residents. No evidence suggests any large undeveloped ground water reserves, although there is little information in most of the region.

*The diagram on the next page graphically illustrates our water supply and what we use it for.*

# Water Supply and Uses in the Rio Chama Watershed



ALL FIGURES ARE LONG-TERM AVERAGES IN ACRE-FEET PER YEAR.



## What do we need for the future?

Keeping the water we have within our communities and our region, including providing adequate safe drinking water, is the most important overall water planning objective voiced throughout the Rio Chama watershed.

Future agricultural water needs will remain at least constant for the foreseeable future, and domestic water needs are increasing. Approximately 12,500 people live in the watershed, a population increase of 22 percent since the 1990 census. Previous predictions have significantly underestimated population growth, especially along the lower Rio Chama from Abiquiu to Española. Over the next 40 years, we expect our population in the region to at least double. More than half of our community water systems sometimes have water shortages. There are few institutions or large commercial users in the region at present, but we need to think about providing water for them in the future.

All these considerations – increasing population as well as the need to upgrade existing water supply systems and provide water for economic growth - suggest that demand for domestic and commercial water will increase substantially over the next 40 years, probably at least doubling from the existing 1,600 acre-feet per year. We should plan to provide 3,000 to 5,000 acre-feet of domestic and commercial water per year for the region as a whole. That's not a lot of water compared to our total depletion of 26,700 acre-feet, but it won't always be easy to be sure it's available in the right places. In some communities we will have to be creative and work hard to identify ways to meet growing domestic water needs without having to transfer agricultural water.

## What can we do about it?

If we can't keep water and water rights within the region our other water planning goals won't make much difference. We need water to provide for growing communities, to make local economic development possible, and to preserve and enhance agricultural opportunities. Already 90 percent of the water from our watershed is available for use downstream, and we need to keep what we have.

To help do this, and make sure water is available when and where we need it, there are seven main goals in the water plan:

- *Preserve the acequia system and strengthen its role in community life*
- *Enhance growing season streamflows (by increasing storage and/or watershed management)*
- *Develop local agriculture with information, marketing, and financial support*
- *Provide reliable water supplies to community water systems*
- *Protect water quality*
- *Conserve water and use resources efficiently*
- *Protect and restore upper watershed areas*

The best ways we can suggest to achieve these goals are discussed below.

### **Preserve The Acequia System**

**Insulate acequias from commodity-value economic pressures.**  
Water rights need to remain with acequias and not be transferred away one parcel at a time, and the State Engineer needs to consider community welfare before approving water transfers.

**Implement appropriate water banking.**

A single statewide "water bank" would probably just provide incentives for our region to lose water, but water banking among acequia parciales or within associations of acequias can help ease water shortages. More water storage would make local water banking much more useful.

**Maintain and repair acequia systems—but don't set them in cement!**

Acequias need repairs and maintenance, but large-scale ditch lining or huge concrete headgate structures cause more problems than they solve.

**Modify the adjudication process.**

It is a good thing to legally recognize and agree on water rights, but the process should be more streamlined and user-friendly for small rights holders, and should recognize our variable streamflow and water use.

### **Provide More Water In The Growing Season**

**Improve high-altitude forest and grassland management.**

In the right places, dense young forests can be thinned, grass cover enhanced, beavers and muskrats encouraged or re-introduced, and small swales, check dams, and small reservoirs can be built to help make streamflow more even throughout the year, especially in the summer when water is needed the most.

**Enhance grass cover and infiltration in lower-altitude areas.**

Swales, check dams, and better grass cover dramatically reduce runoff and erosion, and let more water soak into the ground. Even at lower altitudes, this will result in more springs and more perennial stream flow.

**Explore options for new reservoir storage.**

A series of small reservoirs, perhaps in the upper reaches of the Rio Chama or its tributaries, or even on acequias, could provide additional effective water supply.

### **Support Local Agriculture**

**Enhance marketing opportunities.**

We could support and expand local markets, find more institutional buyers like schools, hospitals, or food services, work with the State to attract food processing facilities, and expand markets outside the region and New Mexico.

## Support Local Agriculture (continued)

### Help finance local agriculture.

Rio Arriba County, local financial institutions, private foundations, federal or state agriculture departments, and local resources like Northern N.M. College, Highlands University, or UNM-Los Alamos may be able to collaborate to identify financial bottlenecks and find ways to overcome them.

### Help with information sharing and technical assistance.

Information would be especially helpful for local stock growers, organic farmers, and young or new farmers trying to get started.

Collaborate widely!

## Reliable Community Water Supplies

### Consolidate community water systems where appropriate.

In some cases, a larger water system with more users and multiple interconnected wells or water intakes may provide more secure water supplies than two or more smaller systems.

### Develop alternatives for providing additional water rights where needed.

Innovative ways need to be found, in collaboration with the State Engineer, to provide water rights for some community systems where individual rights transferred to the water association are not adequate for community needs.

### Optimize location and depth of community wells.

Community water supplies can be increased in some places where wells could tap more productive parts of an aquifer, or need repairs or re-drilling.

### Protect existing communities from unsustainable new water demands.

Rio Arriba County needs its own hydrologist to evaluate the effects of any proposed new development on existing water users before any development approval is granted.

### Gather basic data to permit informed decision-making.

We seldom know how much water community water systems are producing, whether there are leaks, whether water levels in wells are going down, or whether there are other opportunities for making more water available.

### Understand surface water - ground water interactions along the Rio Chama.

In most of the region, available ground water is closely connected to the river system. Water pumped from the valley bottom near the river will be replaced by river water, decreasing flows in the river; and similarly, water "leaked" from acequias or percolating below fields usually recharges river flow fairly soon. We could understand our water system better if we had a better idea where and how these interactions happen.

## Protect Water Quality

### Encourage community wastewater treatment and encourage or require better individual wastewater treatment.

Water tables in almost every community in the region are shallow, and by far the most widespread pollution problem we have is contamination by septic tank effluent. Better wastewater treatment is a crucial need to protect the water we have.

### Mitigate non-point source and agricultural water pollution.

Reducing the erosion that causes most non-point pollution helps with many other water goals, especially getting water to soak into the ground and reappear as more perennial surface flow.

### Regulate development in upper watersheds.

Buildings, roads, and other development in headwaters usually has negative effects like erosion, pollution, and disrupted fire cycles that affect the entire watershed and all water users downstream.

## Conserve Water

### Provide incentives for conservation.

Water law tends to encourage us to "use it or lose it", and these incentives need to be changed so that using water more efficiently provides benefits to the person who saves the water as well as others who get to use the saved water.

### Store conserved water.

Incentives to conserve water would be even stronger if there were more ways to store the water saved.

### Foster practical ways to conserve.

With the right incentives, there are many ways to conserve water, especially in agriculture. Good advice and technical help would make it easier.

## Protect And Restore Our Watersheds

### The goal that helps achieve all the others.

We can manage watersheds to improve both ecological health and hydrological functioning. This will help achieve all our water planning goals. Good watershed management can help with acequia water supplies, make both community and individual water supplies more secure, protect water quality, make acequia maintenance easier, and contribute to the long-term viability of the entire acequia system.

**New Mexico has a unique water history, including international and interstate treaties and growing, thirsty urban areas. We do not have to become a battleground or a statewide water auction. With creative leadership and active cooperation, New Mexico can be an exporter of innovative ways of dealing with a growing worldwide problem.**

Please send any comments, questions, or suggestions you have to:

**Rio de Chama Acequias Association  
PO Box 687  
Medanales, NM 87548**



**Rio Arriba  
Board of County Commissioners  
Española Branch Office**

**COMMISSIONERS**

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Chairman, District 1

Andrew J. Chavez  
District 2

Felipe D. Martinez  
District 3

**COUNTY MANAGER**

Lorenzo J. Valdez

**RESOLUTION NO. 2005-070**

**Approving the Rio Chama Regional Water Plan**

**WHEREAS**, water resources are vital to the social, cultural, environmental and economic well-being of the communities of Rio Arriba County;

**WHEREAS**, locally owned and controlled water rights are crucial to the economic viability and environmental sustainability of the communities of Rio Arriba County;

**WHEREAS**, the Interstate Stream Commission provides funds for Regional Water Planning in Rio Arriba County, New Mexico;

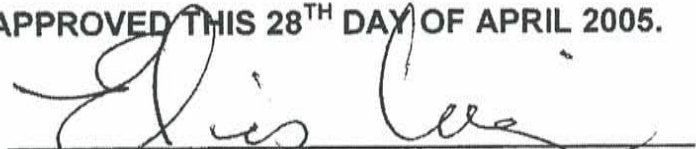
**WHEREAS**, the Rio Chama Regional Water Plan provides planning and research of the essential needs and alternatives for the understanding of water in our region;

**WHEREAS**, acequias are a vital element of the cultural heritage and are the basis for the land based agricultural economy of historic, traditional communities of New Mexico and acequia systems provide important ecological benefits such as riparian habitat and aquifer recharge;


**WHEREAS**, acequias are politically subdivisions of the state that sustainably manage water resources at the local level through centuries-old customs and traditions.

**THEREFORE, LET IT BE RESOLVED**, that the Rio Arriba County Board of County Commissioners wish to approve the Rio Chama Regional Water Plan.

SIGNED, ADOPTED AND APPROVED THIS 28<sup>TH</sup> DAY OF APRIL 2005.

  
\_\_\_\_\_  
ELIAS CORIZ, Chairman District I

  
\_\_\_\_\_  
ANDREW J. CHAVEZ, Commissioner District II

  
\_\_\_\_\_  
FELIPE MARTINEZ, Commissioner District III



ATTEST:

  
\_\_\_\_\_  
J. FRED VIGIL, County Clerk

*Archie Vigil*  
MAYOR

BOARD OF TRUSTEES:

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*Kenneth C. Downes & Asso. P.C.*  
ATTORNEY

April 6, 2006

Rio Chama  
Regional Water Plan  
1122 Industrial Park  
Española, NM 87532

Dear Mr. Vigil:

The Mayor and Public Works Department of the Village of Chama met with you and members of the RCAA organization on March 23, 2006 at the Village Council chambers. The purpose of the meeting was to review the progressive regional water plan under development by the RCAA.

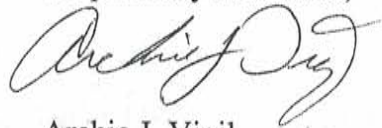
Each of the organization members went over the plan as it pertains to their disciplines and sections in the plan the plan and how it will potentially impact the Vilalge of Chama.

The Village questioned several areas of the plan. All of our concerns were well addressed by the RCAA staff. The Village feels that the plan will impact Chama in a very positive way. The questions and concerns that the Village have are:

1. How will this plan improve on the watershed health in this area?
2. What about water rights and how will water right transfers be addressed?
3. How will the domestic wells in the area be affected?
4. Will this plan support funding capacity/support for Village projects as they relate to continued development of our infrastructure?
5. What about by-laws in the area? How will they be addressed?

You and your organization members did an excellent job of addressing our concerns and how the Village of Chama fits into the plan.

Respectfully submitted,



Archie J. Vigil  
Mayor

Cc: Council members

April 10, 2006  
Ms. LeFevre  
Page 1 or 4

April 10, 2006

Andrea LeFevre  
Water Administrator  
Jicarilla Apache Nation  
P.O. Box 507  
Dulce, NM 87528

RE: Draft Rio Chama Regional Water Plan

Dear Andrea:

I have reviewed the draft Rio Chama Regional Water Plan (no date, electronic version provided by Mary Helen Follingstad, Interstate Stream Commission on April 6, 2006) with respect to information or conclusions that are relevant to the Jicarilla Apache Nation.

1. The plan should include a map showing the location of the Jicarilla Apache Reservation and pueblo boundaries.

*Response: We would support the intent of the comment, but at the time comments were received there was no longer time and funding to prepare an additional map.*

2. In Chapter 3 Legal Issues, under the section on State Laws, the completion of the adjudication of the Jicarilla Apache Nation Water Rights in the Chama Basin should be mentioned. The citation is:

Partial Final Judgment and Decree of the Water Rights of the Jicarilla Apache Tribe in the Rio Chama Adjudication Suit (N. CIV 7941 JC). April 6, 1998

*Response: The citation has been included, on page 3-4.*

3. The amount of Jicarilla-Apache water rights adjudicated under the above mentioned decree could be included in Chapter 3, Legal Section under the discussion of Indian Pueblo and Tribal Water Rights. If the Jicarilla Apache Nation would like this information in the Rio Chama Water Plan, tables 4-5 and 4-6 (see attached) of the draft Jicarilla Apache Nation Water Plan could be provided to the authors of the Rio Chama Regional Water Plan.

*Response: The details of adjudicated Jicarilla tribal water rights had not been received at the time of printing the Water Plan; however, we certainly recognize that these rights are adjudicated.*

4. Any other water rights adjudicated should be included in the Rio Chama water plan along with an estimate of the percent pending.

*Response: This information (approximately 2/3 to 3/4 of the non-Indian surface water rights in the watershed have been adjudicated) has been added on page 3-4.*

5. Chapter Four, Surface Water Supply, second paragraph, last sentence (page 4-7) could be revised with the inclusion of the underlined portion as follows: "Some limited irrigation also occurs in small tributaries just south of Willow Creek, such as those draining Stinking Lake or Horse Lake, located on the Jicarilla Apache Reservation."

*Response: Concur; added to page 4-7, left column.*

6. Table 4-9 on page 4-18 cites Wilson and Lucero, 1992 as the source for irrigated acreage. More current data on irrigated acreage are available and used later in Chapter 5.

*Response: Concur; table was updated.*

7. Table 4-17 shows the range of predicted tributary flows and observed flow where available. Is the observed flow a median or average? Also, no observed value is provided for Willow Creek, although the footnote shows a period of record from 1943-1970.
8. Table 4-18 does not appear to include evaporation from storage of San Juan-Chama project water, but it is not clear if the outflow is adjusted for SJC flows or not.

*Response: This table does not include either input or evaporation of San Juan-Chama water, and a note clarifying this point has been added.*

9. The water supply assessment in Chapter Four estimates recharge to groundwater in very high volumes and states that this likely returns to the stream because the aquifers have very little storage capacity. It may be more helpful to have a map showing where aquifers with significant storage exist and only estimate recharge for those aquifers. In any case, it would be helpful to have a map showing where groundwater is available.

*Response: We wish it had been possible to develop and include such maps, but insufficient information exists to reliably map either the extent of aquifers with significant storage capacity, or even where ground water is nominally available.*

10. Table 5-4 lists irrigation water demand by tributary, but does not include irrigation diversions by the Jicarilla Apache Nation on Horse Creek. This table does not appear to include direct diversions from the Rio Chama, also by the Jicarilla-Apache Nation and others.

*Response: This information did not appear in the Hydrographic Surveys or other sources available when the Water Supply chapter was written. We concur that it would be desirable to include these withdrawals in future updates of the Water Plan.*

11. The lake evaporation discussed on page 5-13 shows an estimated total lake evaporation of 4,669 ac-ft/yr for the entire Rio Chama Watershed (not including man-made reservoirs). The Jicarilla Apache Nation has 2,550 ac-ft of evaporation rights (including stock ponds) in the Chama basin, or more than 50% of the total. Most of the lakes mentioned in the text are on the Jicarilla Apache Reservation and this should be stated. The estimate of reservoir evaporation should be checked using GIS coverage to include all lakes and stock ponds in the Rio Chama watershed.

*Response: Calculation of evaporation from all lakes and pond using GIS technology, as suggested, was not possible with available resources when the relevant sections of the Plan were written. As mentioned in connection with the previous comment, we concur that this would be desirable in future updates.*

12. Under the Alternatives in Chapter 7, the first stated goal is to preserve the acequia system with suggestions of how to retain water rights in the region. While acequias have the power now to pass bylaws prohibiting such transfers out of the region, the plan is stating that this is what is best for the public welfare of the region. Public welfare can be used by the State Engineer if the evaluation of water right transfers. The Jicarilla Apache Nation may want to comment on this aspect of the plan as it could impact the water rights acquired under state law.

*Response: Further comments addressing this issue had not been received at the time of printing the Plan. We refer readers to the Public Welfare statement in Chapter 7, beginning on page 7-2.*

13. On page 7-13, the goal *Enhance Growing Season Streamflows* discusses methods for treating forest health to increase the yield of stream flows. The hydrologic impact of improving forest health is more likely to change the character of run-off than the total yield. With improved grass cover, run-off will be slowed and made available for a longer period of time and reduce the erosive power of runoff. It is suggested that the text be revised to de-emphasize the potential for increased yield.

*Response: We concur that changes in the timing and character of the runoff hydrograph (rather than total annual discharge) may be the more important effects of the kind of watershed management recommended, and this is emphasized in the alternative as proposed on page 7-14, and in the evaluation on page 7-16.*

14. Two other alternatives are discussed, increasing reservoir storage and aquifer storage and recovery. It is not clear what water is available for storage. Creating storage space does not create water available for diversion.

*Response: We do recognize that water rights would be needed for stored water, and this would have to be addressed in one or more of the ways mentioned in Chapter 7.*



April 10, 2006  
Ms. LeFevre  
Page 4 or 4

15. On page 7-35, the plan states that Rio Arriba County should regulate and discourage development in the upper watershed areas. It should be mentioned that a significant part of the upper watershed is on the Jicarilla Apache Reservation where Rio Arriba County has no authority to regulate.

*Response: We recognize that Rio Arriba County has no land use jurisdiction within the Jicarilla Apache Reservation, and this is noted on page 7-38, right column.*

If you have any questions, please call me at 505-982-0405.

Sincerely,

Amy Lewis