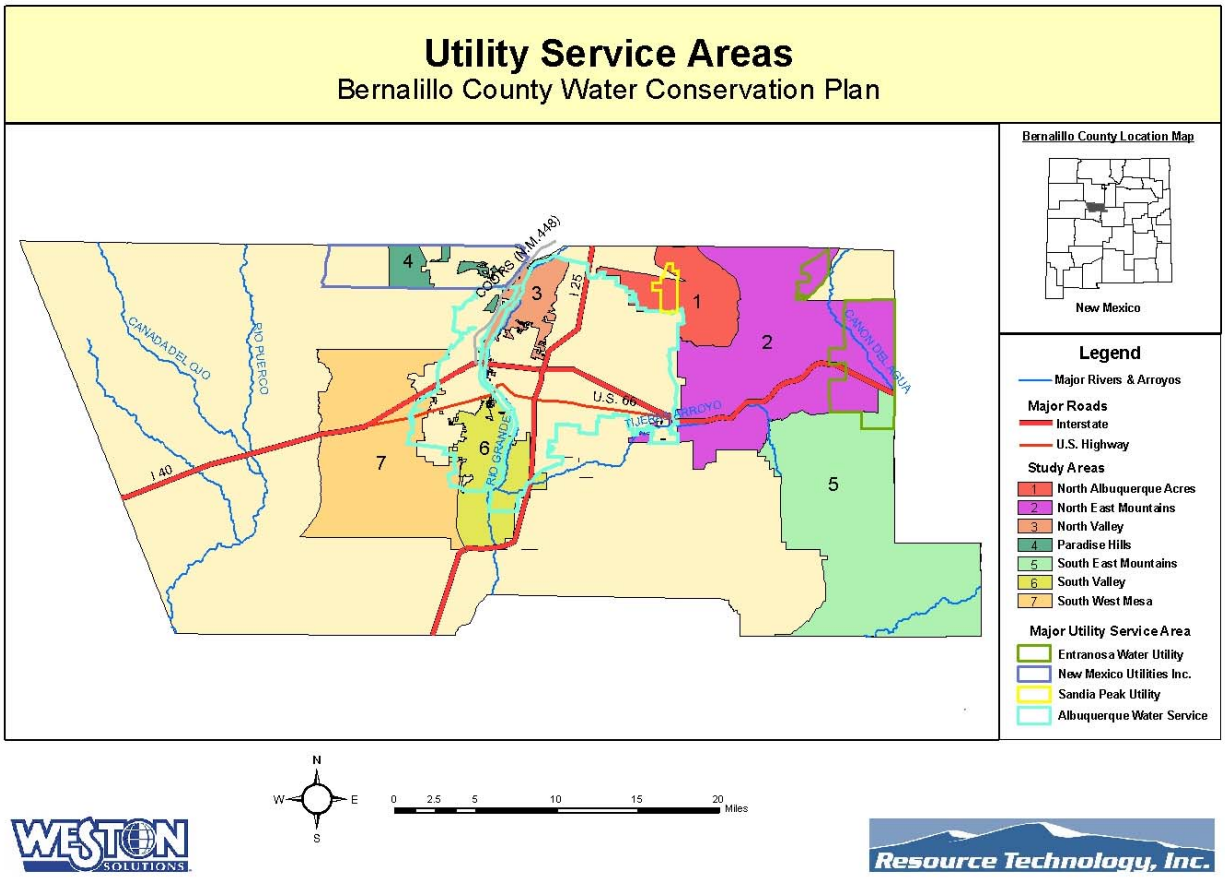
APPENDICES

APPENDIX A
MAP OF UNINCORPORATED COUNTY SHOWING UTILITY BOUNDARIES


Utility Service Areas
Bernalillo County Water Conservation Plan
Bernalillo County Location Map
New Mexico
Legend
Major Rivers & Arroyos
Major Roads
Interstate
U.S. Highway
Study Areas
1 North Albuquerque Acres
2 North East Mountains
3 North Valley
4 Paradise Hills
5 South East Mountains
6 South Valley
7 South West Mesa
Major Utility Service Area
Entranosa Water Utility
New Mexico Utilities Inc.
Sandia Peak Utility
Albuquerque Water Service
CANADA DEL OJO
RIO PUERCO
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TIJERAS ARROYO
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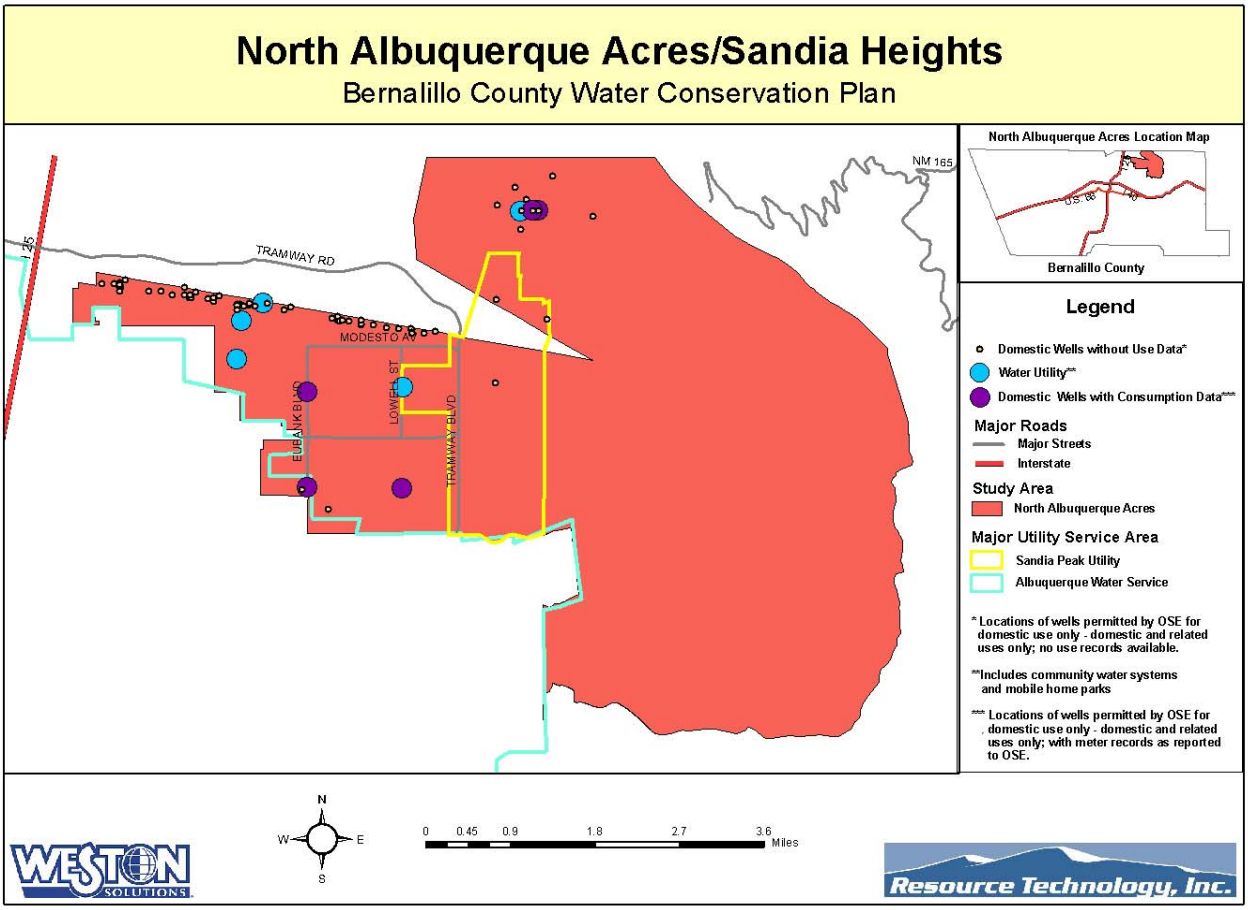
APPENDIX B
STUDY AREA MAPS


North Albuquerque Acres/Sandia Heights
Bernalillo County Water Conservation Plan
NM 165
TRAMWAY RD
MODESTO AVE
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TRAMWAY BLVD
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North Albuquerque Acres Location Map
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Bernalillo County
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Domestic Wells without Use Data*
Water Utility**
Domestic Wells with Consumption Data***
Major Roads
Major Streets
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Study Area
North Albuquerque Acres
Major Utility Service Area
Sandia Peak Utility
Albuquerque Water Service
* Locations of wells permitted by OSE for domestic use only - domestic and related uses only; no use records available.
**Includes community water systems and mobile home parks
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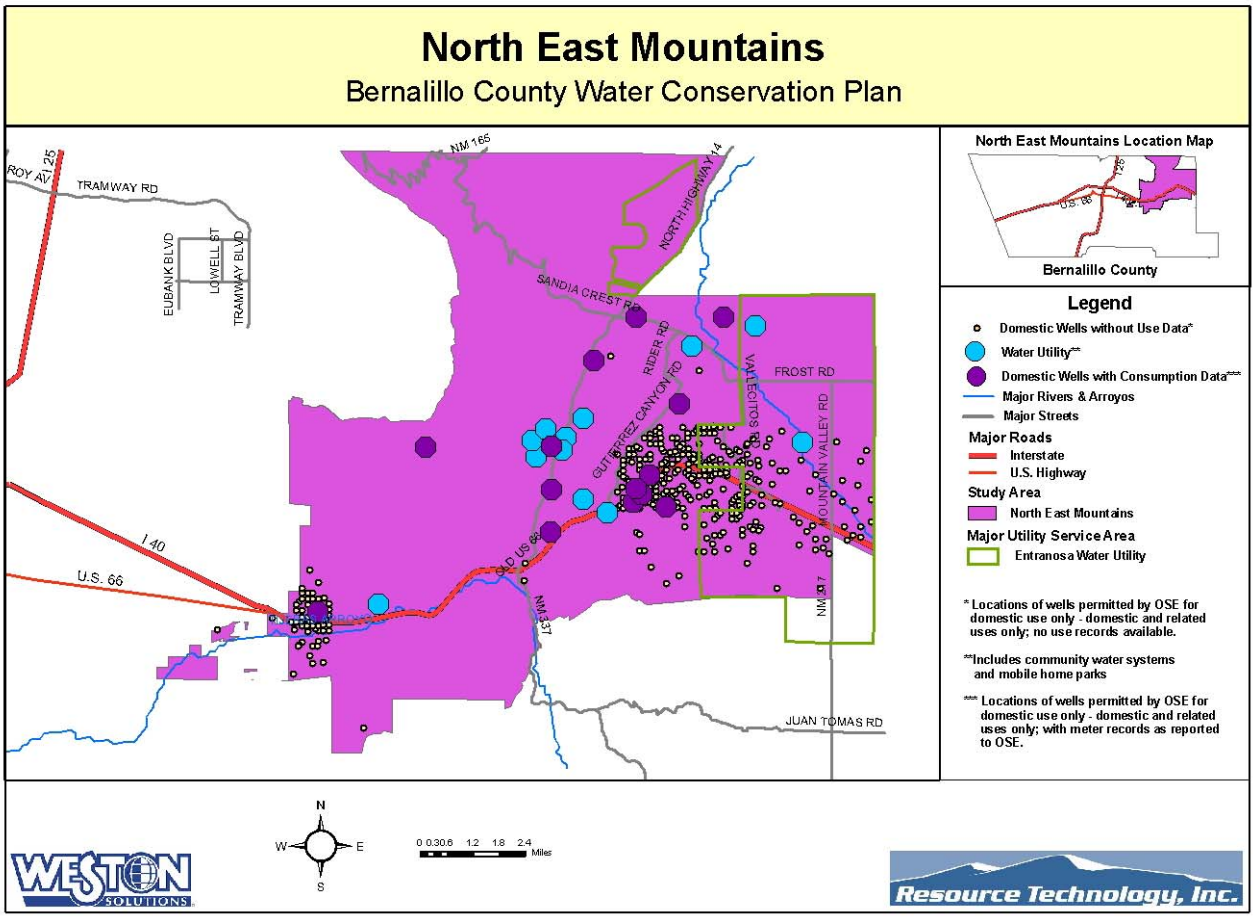
Resource Technology, Inc.


North East Mountains
Bernalillo County Water Conservation Plan
TRAMWAY RD
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LOWELL ST
TRAMWAY BLVD
NM 165
NORTH HIGHWAY 14
SANDIA CREST RD
RIDER RD
GUTIERREZ CANYON RD
VALLECITOS RD
FROST RD
MOUNTAIN VALLEY RD
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OLD US 66
NM 337
NM 217
JUAN TOMAS RD
North East Mountains Location Map
Bernalillo County
Legend
Domestic Wells without Use Data*
Water Utility**
Domestic Wells with Consumption Data***
Major Rivers & Arroyos
Major Streets
Major Roads
Interstate
U.S. Highway
Study Area
North East Mountains
Major Utility Service Area
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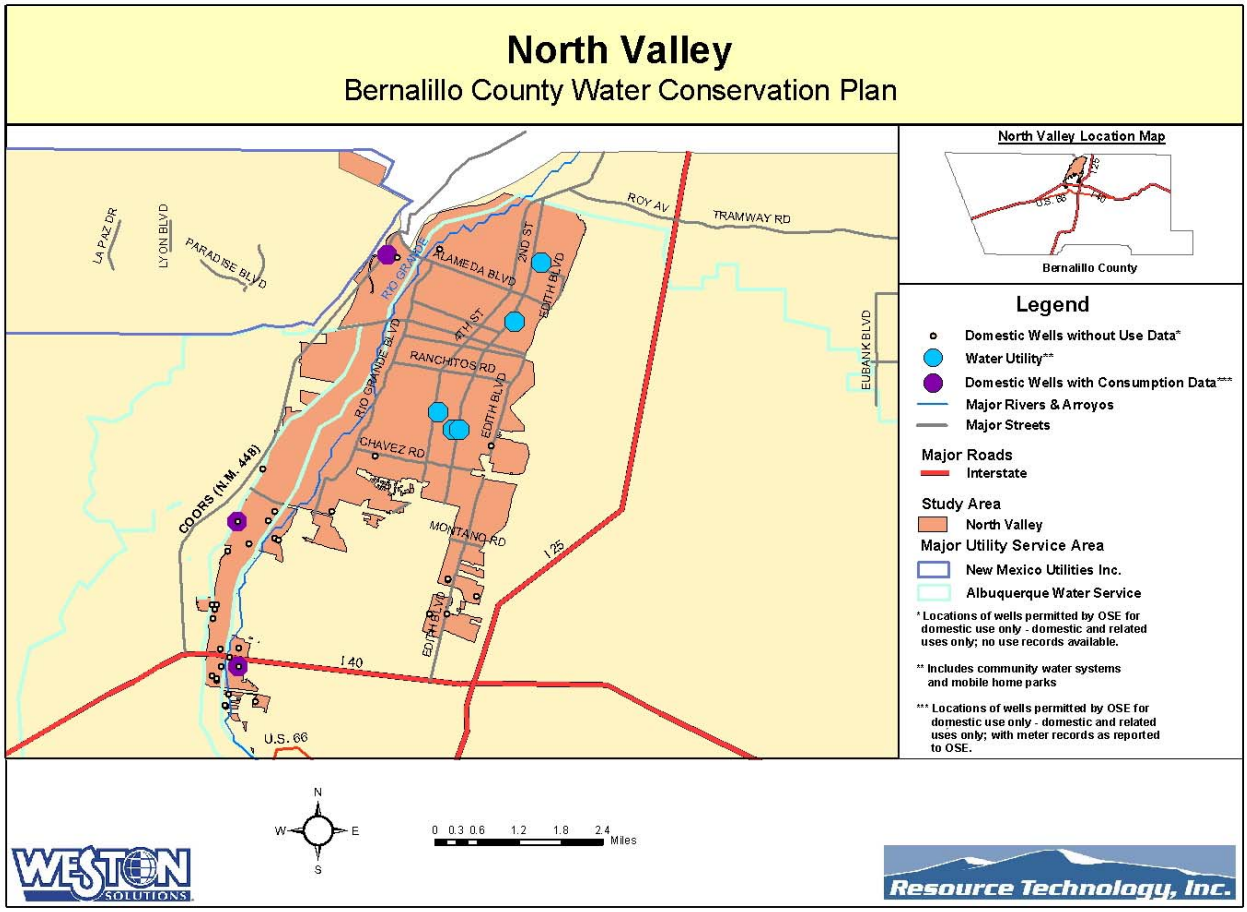
North Valley
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North Valley Location Map
Bernalillo County
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Water Utility**
Domestic Wells with Consumption Data***
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Major Utility Service Area
New Mexico Utilities Inc.
Albuquerque Water Service
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4TH ST
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RIO GRANDE BLVD
CHAVEZ RD
EUBANK BLVD
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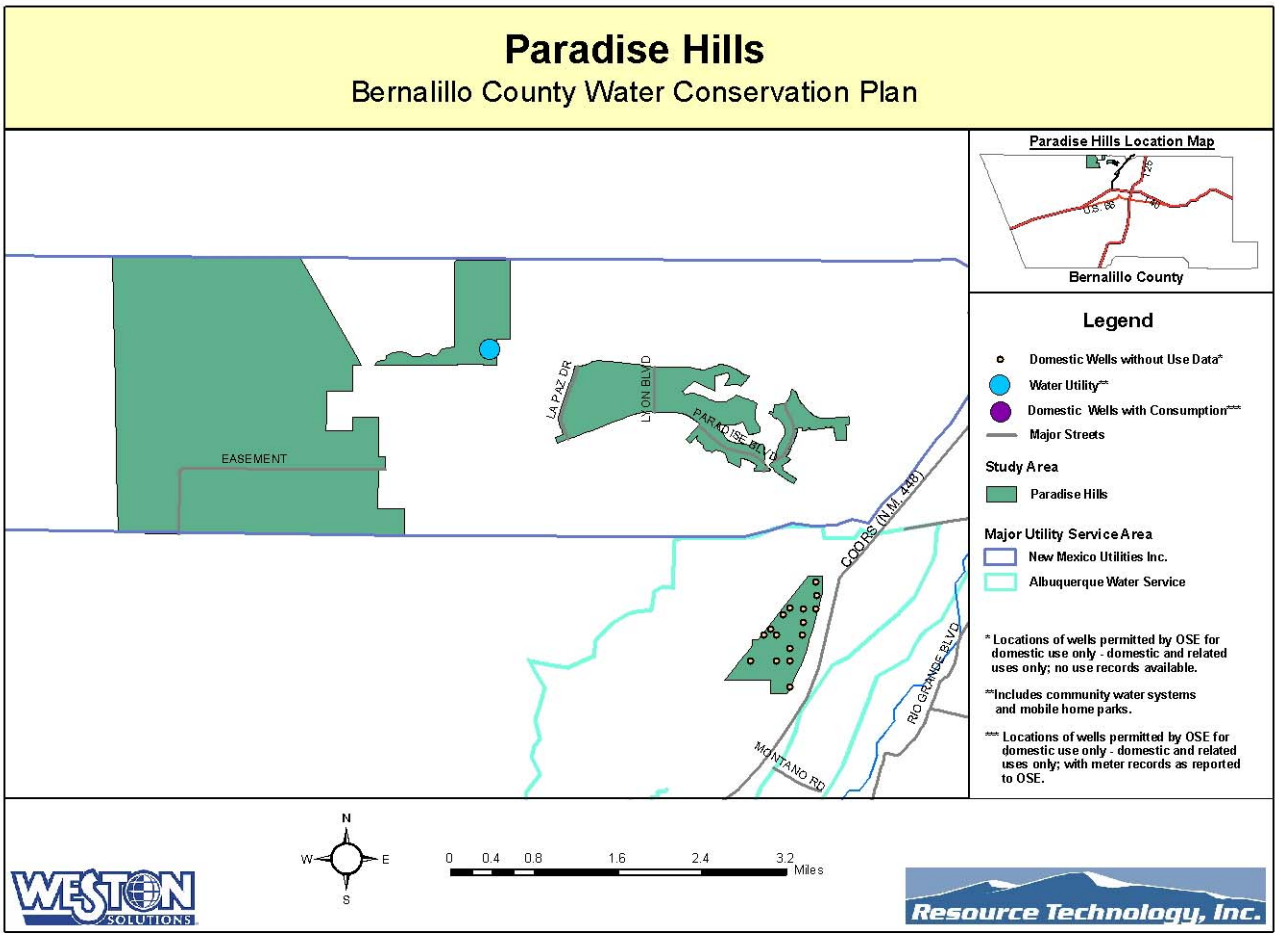
Resource Technology, Inc.


Paradise Hills
Bernalillo County Water Conservation Plan
Paradise Hills Location Map
Bernalillo County
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Domestic Wells without Use Data*
Water Utility**
Domestic Wells with Consumption***
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Paradise Hills
Major Utility Service Area
New Mexico Utilities Inc.
Albuquerque Water Service
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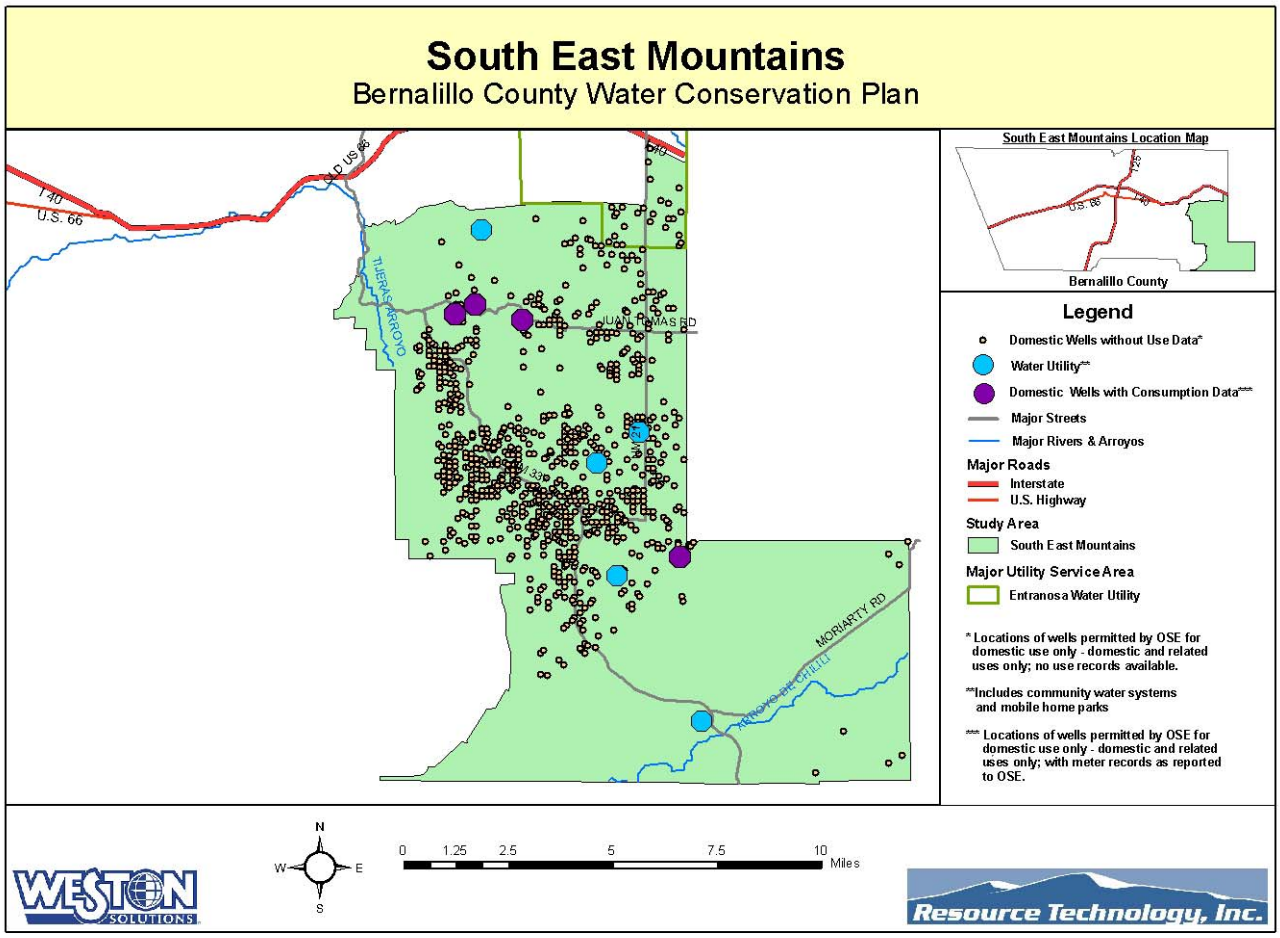
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Water Utility**
Domestic Wells with Consumption Data***
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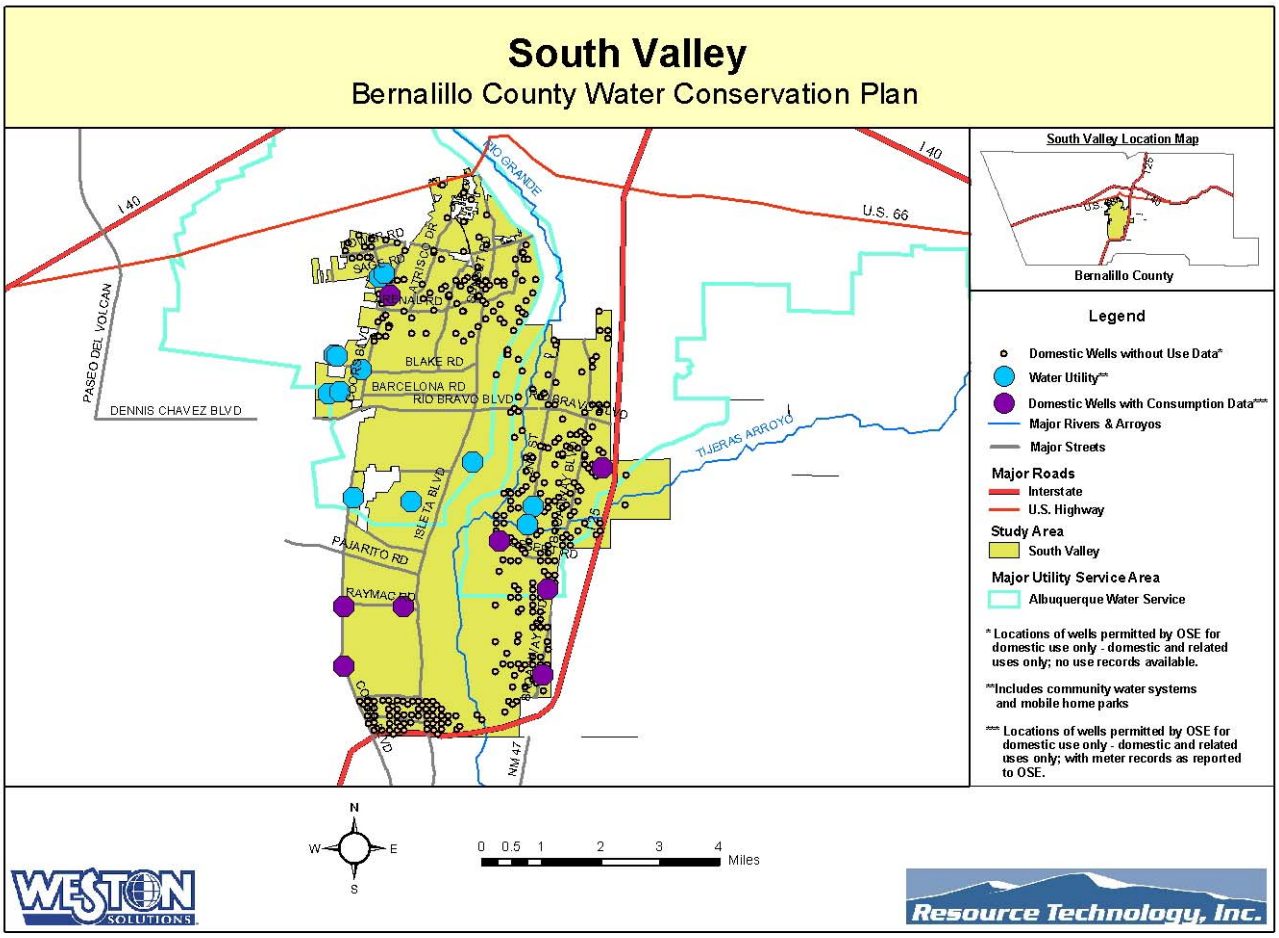
South Valley
Bernalillo County Water Conservation Plan
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BARCELONA RD
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ISLETA BLVD
PAJARITO RD
RAYMAC RD
TIJERAS ARROYO
NM 47
South Valley Location Map
Bernalillo County
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Domestic Wells without Use Data*
Water Utility**
Domestic Wells with Consumption Data***
Major Rivers & Arroyos
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Study Area
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Albuquerque Water Service
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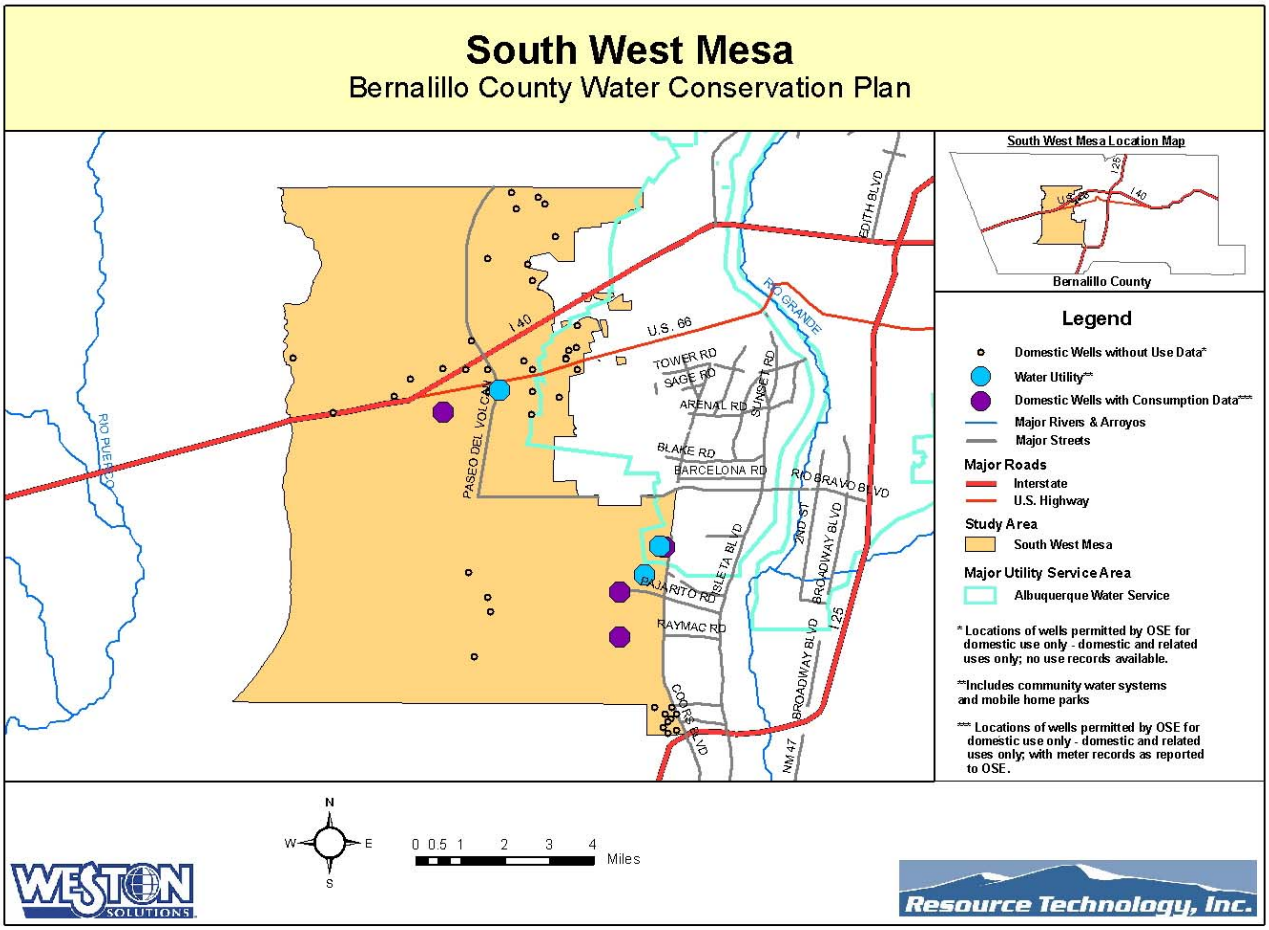
South West Mesa
Bernalillo County Water Conservation Plan
South West Mesa Location Map
Bernalillo County
Legend
Domestic Wells without Use Data*
Water Utility**
Domestic Wells with Consumption Data***
Major Rivers & Arroyos
Major Streets
Major Roads
Interstate
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Study Area
South West Mesa
Major Utility Service Area
Albuquerque Water Service
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RIO PUERCO
PASEO DEL VOLCAN
TOWER RD
SAGE RD
ARENAL RD
SUNSET RD
BLAKE RD
BARCELONA RD
RIO BRAVO BLVD
2ND ST
BROADWAY BLVD
ISLETA BLVD
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APPENDIX C
COMMUNICATIONS PLAN

Bernalillo County Water Conservation Communication Plan

April 19, 2006

Mounting an effective water conservation program for Bernalillo County will be a complex undertaking. The Albuquerque/Bernalillo County Water Utility Authority serves 160,000 accounts and 450,000 citizens with a single water supply delivered to well-defined area. In sharp contrast, the County conservation program must address a population that receives water from diverse sources -- public and private utilities, community water systems, and private wells. It is a population with a wide variety of attitudes toward water issues. The County area reflects enormous diversity. This communication plan concentrates on six distinct population areas: East Mountains (combines the north and south study areas), Paradise Hills, North Albuquerque Acres/Sandia Heights, North Valley, South Valley and the South West Mesa.

Some areas are served by the Albuquerque/Bernalillo County Water Utility Authority. Others are served by community water systems and utilities, with customer bases ranging from a fifteen to thousands of connections. And still others draw their own water predominantly from wells. Total population in the six areas studied is 107,619, representing 39,328 households with an average size of 2.7 persons. (The largest household size is the South West Mesa at 3.2, and the lowest is 2.5 in the North East Mountains, North Albuquerque Acres/Sandia Heights and North Valley).

Water Use

The standard measure of customer water use is gallons per capita per day (GPCD). The people in the six targeted areas use 105 GPCD (North Albuquerque Acres/Sandia Heights are at the high end with 131 GPCD, and the South East Mountains are at the lowest with 54), although the GPCD for the North Valley and South Valley are likely underestimated because many residents supplement outdoor irrigation with surface water and existing domestic wells. Fifty-five percent of this population, or 59,313 persons, are served by one of the major utilities (major defined as having 1,000 connections or more in a study area). Eight percent are served by smaller utilities. And, 40,158 or 37% are estimated to be on domestic wells. Generally speaking, aside from mass media and other targeted activities, 63% of the audiences in these areas might be reached through utilities, while the balance that are on domestic wells will provide the greatest communication challenge.

This communication plan is sub-divided into three basic components:

I. PULSING THE PUBLIC
Assessing public understanding of fundamental water supply issues
Determining public receptivity and obstacles to effective conservation
Identification of the target audiences

II. COMMUNICATION STRATEGY
Key messages
The communication plan
Materials and methods

I. PULSING THE PUBLIC

In the late spring and early summer of 2005, County officials sponsored a series of public meetings in five locations representing the seven planning areas (Paradise Hills, North Valley, North Albuquerque Acres/Sandia Heights, East Mountains – North and South - and the South Valley/South West Mesa). The purpose of the meetings was to assess the public's practices and preferences about water issues; obstacles to effective conservation, and to identify how the County could better promote water conservation among its citizens.

The following is an analysis of the public discourse that occurred in those meetings. There were a number of consistent "threads" that ran through these meetings. These "threads" must be carefully woven into the County's water conservation communication.

Principal Obstacles to Water Conservation
Participants described the principal obstacles as predominantly their own ignorance or lack of education on specific conservation measures/resources. They also pointed to apathy and lack of interest as factors as obstacles to effective conservation. These were very strong threads throughout all public meetings. They are an acknowledgement that the public needs more information and education on water issues. This bodes well for an effective communication campaign.
Other obstacles they enumerated were:

- Excessive population growth and new housing
- Lack of incentives
- Gray water system problems
- Excessive golf course water use
- High expense of water-saving appliances and systems
- Lack of well-metering and the three acre-foot limit
- Challenges posed by "water compacts" and water laws
- Non-enforcement of existing regulations
- Non-New Mexico developers who don't understand our water challenge

Other principal threads that emerged from the public meetings:

THREAD 1 – "We know water conservation is important."

Most residents are quite familiar with the importance of water conservation. This suggests, that for the majority, communication activity that is focused exclusively on the value of conservation may be "preaching to the choir."

RECOMMENDATION: The focus of communication resources should be on specific methods to conserve water rather than on general, non-specific conservation messages.

THREAD 2 – Exploring the "Why"

Knowing that an issue is important is quite different from knowing "why" it is important. There is broad concern about water supply. The ***rationale*** for conservation, as it impinges on water supply issues, must be reinforced in all future communication activities.

RECOMMENDATION: Communications must continually reinforce public understanding of the County's limited water resources, aquifer dynamics, the role of surface water, and the Water Utility Authority's San Juan-Chama Drinking Water Project as well as the impacts of drought, diminishing supplies and cost of "new water."

THREAD 3 – "We're already conserving."

Most participants report they practice conservation measures, but the majority of their activities are low-efficiency practices. High efficiency activities such as xeriscaping and low-flow fixtures are implemented by a very low percentage of participants. While they rank "residential use" as the most important use of water, less than 20% of respondents engage in water harvesting and xeriscaping. An even smaller percentage reports the use of low water use fixtures.

RECOMMENDATION: There needs to be significant resource allocation to the communication of "how to" conservation measures, with emphasis on high efficiency results (affording the "biggest bang for the bucks" such as major landscape adjustments, fixture retrofits, etc.)

THREAD 4 – "We need more education on conservation issues"

This is a very strong thread throughout all public meetings. It reflects a public willingness to be informed and educated on water issues that bodes well for an effective communication campaign.

RECOMMENDATION: The thrust of the public communication program should be predominantly educational and informational.

THREAD 5 – "Don't mess with my well."

Many well users are independent souls and express resistance to government intervention in how they operate their wells.

RECOMMENDATION: Educational/informational communications should be directed to well users, emphasizing that they have a hands-on opportunity to ensure their own future water supply with efficient well practices. Utility customers do not have such direct opportunities.

THREAD 6 - How can the County help?

Although there is some hesitation and indeed suspicion about government intervention in their water use, participants were receptive to a number of potential initiatives that might be undertaken by the County. But, the preferred role of the County is seen more as collaborative, and less as regulatory.

RECOMMENDATION: Although there is some hesitation and indeed suspicion about government intervention in their water use, participants were receptive to a number of potential initiatives that might be undertaken by the County. But, the preferred role of the County is seen more as collaborative, and less as regulatory. Initiatives discussed included:

- More public education on what is required
- Incentives and rebates
- Incentives for developers
- Tightening laws for new developments
- Free water-use audits
- Encouragement of low impact development/community gardens
- Substantive zoning review
- Info packets for new residents
- County should set good example about what it is doing
- County should collaborate closely with public and private utilities
- Less gray water regulation-education/workshops
- More education/workshops on conservation

It is also apparent that the County needs to educate the public about the measures the County has undertaken to conserve water in its facilities and operations.

THREAD 7 – A diverse universe

There are widely divergent interests and concerns among the six sectors. These run the gamut from values to culture, traditional use vs. development, rural vs. urban, etc.

RECOMMENDATION: While there must necessarily be some communication activity that reaches all sectors, targeting mechanisms such as direct mail, neighborhood meetings, print materials and bill inserts should be utilized to deliver topic-specific information to the proper audiences (i.e., East Mountain h Valley agricultural uses, etc.)

THREAD 8 - Water Quality

While this was not a pervasive issue in the public meetings, it was raised often enough that it should be addressed in the water conservation communication plan

RECOMMENDATION: Communications should include a focus on water quality issues, including nitrates and arsenic removal.

THREAD 9- "We need to control new development"

Virtually across the board, and largely in response to the question: "How can the County

promote water conservation?" citizens expressed the need to ensure that development occur in a measured, responsible manner. These aspirations were variously articulated in repetitive references to:

- Stricter ordinances and standards for new developments
- Control of population growth and new housing
- Encouragement of low impact development
- Zoning reviews to limit new development
- Tighten laws authorizing subdivisions
- Institute grey water system incentives for builders/developers
- Consider well metering
- Consider promoting tiered billing for utilities within the County
- Establish incentive and rebate programs
- Reward low water use

RECOMMENDATION: The County water conservation plan must address growth and development. The County needs to articulate current development requirements, then engage the public in options for water resources management in development. The plan must address water conservation at many levels, such as re-use, conservation incentives and stricter requirements.

II. COMMUNICATION STRATEGY

Potential Goal: **Reduce water use in County by 10% in three years:**

4% reduction - Year One
3% reduction - Year Two
3% reduction - Year Three

10% reduction - Total

Objective:

- **Educate, inform and motivate residents about the importance of conservation**

Strategies:

- **Conduct mass media education/information campaign to all areas with messages regarding finite nature of ground water**

- **Target specific planning areas via localized media, print materials and outreach activities**

- **Target customers of public/private utilities via collaboration with these entities, through bill inserts, brochure distribution, etc.**

- **Reach non-utility residents (well users) via direct mail and localized print media (newsletters, tabloids, etc.).**

- **Focus all communication activities on "how-to information" such as:**
  - **low water-use landscaping**
  - **Optimum well maintenance**
  - **Optimum irrigation practices**
  - **High efficiency water-use appliances**

- **Devise/acquire print materials to support the above subjects**

- **Conduct workshops to educate residents on the above**

Strategy Rationale:

An effective plan must respond to County citizen interests and concerns while it addresses the County's need to foster enhanced conservation activity.

Exploring the "Why"

Citizens say they know they should conserve, but knowing that an issue is important is quite different from knowing why it is important. There is broad concern about water supply. The *rationale* for conservation (high desert climate, likelihood of long-term drought, finite water supply, unresolved legal issues) must be reinforced in all future communication activities.

The thrust of the public communication program should be predominantly educational and informational.

Communications must continually foster public understanding of the County's limited water resources, aquifer dynamics, the importance of individual conservation activities as part of the overall need to save water and ground water protection.

A Communication Plan for All

There are widely divergent interests and concerns among County residents. These run the gamut from closely-held values about the importance of water to consumer-oriented perceptions of the role of water in our lives; from low-income to high, traditional use vs. growth and development, rural vs. urban, etc. This suggests that although some issues will need to be covered across the entire unincorporated area, targeted messages and activities need to be focused on the specific study areas, given the range of values and issues.

How to Do It

The focus of communication resources should be on specific methods to conserve water rather than on general, non-specific conservation messages (i.e., "Here's how to achieve maximum efficiency from your well," rather than "Let's all save water because it's the right thing to do!"). Activities must emphasize high efficiency results (affording the "biggest bang for the bucks" such as major landscape adjustments, fixture retrofits, etc.).

Well Maintenance

In parts of the County, well users are reporting variable gallons per minute yield, wells going dry and needing to be drilled deeper. Communications should be directed to well users, emphasizing that they have a hands-on opportunity to help ensure their own future water supply with efficient well practices.

Policy Decisions
The County should consider implementing the following steps which residents consider would contribute to improved conservation practices County-wide.

- Tighten laws authorizing subdivisions
- Institute grey water system incentives for builders/developers
- Consider metering of wells
- Consider promoting tiered billing for utilities within the County
- Establish incentive and rebate programs
- Reward low water use
- Water audits

Hitting Targets
While there must necessarily be some mass media activity providing an educational "backdrop" reaching all sectors, targeting mechanisms such as direct mail, neighborhood meetings, localized print media, other print materials and bill inserts should be utilized to deliver topic-specific information to the proper audiences.)

Communications should include a focus on water quality issues with particular emphasis on the arsenic challenge and its remediation.

Citizens themselves have asked that the water conservation plan address what many perceive to be uncontrolled (or poorly managed) growth and development. Communicating current County development requirements, as well as addressing new measures will be perceived by many as putting "teeth" into the County plan.

KEY MESSAGES

- ***The aquifer that serves Bernalillo County has a finite supply of water.***
- ***Continued prosperity in this region requires that our water supplies be managed with great care.***
- ***The County calls upon all residents to conserve as much as possible.***
- ***The County will do everything in its power to assist residents in achieving this goal.***
- ***The County is embarking on a comprehensive educational/informational conservation program aimed at helping residents save water.***

THE COMMUNICATION PLAN

Kicking it off
A major "kick-off event" will be conducted to mark the launch of the County's water conservation program. This will take the form of a press conference. Members of the Albuquerque/Bernalillo County Water Utility Authority board, City and County officials will be recognized. Articulate spokespersons from each of the study areas will be asked to speak.

Urgency
A sense of urgency will be necessary to galvanize the public interest. All conservation messages will have a two-fold intent: 1.) "Water conservation is essential to our well-being;" 2.) "Here's how you can do it." Hence, virtually all message activities will teach residents how to get a handle on water conservation.

Setting a Goal
A countywide goal should be established. Baseline data should be developed to enable the County to assess progress toward the goal in the immediate years ahead. Where practical, competition, may be encouraged among the utility customers of the study areas, with for example, Paradise Hills challenging Sandia Heights to a specific reduction goal. Donated prizes may be awarded. All communications will unfold on a two-track basis:

Tailored Communications
As broad public awareness activities are unfolding, a tailored communication plan will be launched in each of the six planning areas. (see **TARGETING THE PLANNING AREAS** below).

Track One – Mass Media
It is essential that the County establish a close working relationship with the Albuquerque/Bernalillo County Water Utility Authority. The ABCWUA will itself be engaged in extensive public awareness activities, and it is important that such activities be coordinated between the County and the Authority. A **major radio, television and print campaign,** should be launched to provide the "context" for an unprecedented Countywide educational/informational initiative. This approach, although not as cost-effective as a surgically targeted thrust, is essential because fully 37% of our audiences operate mostly non-metered domestic wells, and there is no institutional conduit to them. This mass media approach will serve as an urgent "context" for all County residents to understand the importance of water conservation, and to increase their participation.

Track Two – Focused Activities
The County must work closely with the public and private water systems that serve 63% of the targeted population. Effectively these entities are the **"gatekeepers**" that could enable the County to deliver conservation messages directly to their customers. Through them the County could disseminate bill inserts, brochures, and other how-to communication materials. This is a critically important element, as it will enable the

County to **"hit the targets"** directly, rather than obliquely, which is the mode of mass media. It is, therefore, essential that the County learn as much as possible about these utilities, their communications with customers and their rate structures.

The program will consist of **educational activities** such as seminars and workshops teaching residents how to minimize water use via high-efficiency appliances, low-water-use landscaping, water harvesting, reuse techniques, optimum well maintenance, and agricultural conservation.

County staff should seek meetings with representatives of these utilities to discuss the possibility of **joint activities** such as workshops and conservation demonstrations addressing the interests of utility customers. The County should provide these utilities **with pre-printed educational/informational bill inserts** and other "how-to" materials for dissemination to their customers/members.

The County should cooperate with the **Xeriscape Council of New Mexico** via utility bill inserts and mass media. The Xeriscape Conference annually features presentations by low-water-use landscaping experts, displays of a wide variety of drought-tolerant grasses and plants and exhibits of optimum irrigation methods. A free xeriscape (donated by vendors) should be offered as an attendance incentive**.** Wherever practical, educational activities about xeriscaping should be made available at community events in all planning areas.

Additional targeting opportunities:
Because residents of some of the areas may not perceive themselves to be directly connected to County Government and the County has little means of identifying them specifically, it is essential that other means to reach into these areas be explored. There are numerous, less obvious ways to reach these citizens beyond mass media and/or bill inserts.

Direct mail –For areas that are not covered by County lists or utility customer rosters, lists of unreachable residents can be purchased on a zip code basis. List service organizations can take County information (such as overprints of bill inserts) and manage the mail outs completely.

Extending the Message
Virtually all areas are served by modest-distribution **print vehicles.** These should be researched and engaged for carriage of water conservation messages throughout the areas we are focusing on. These vehicles include, but are not limited to:
Neighborhood newsletters
Thrifty Nickel
Regional papers (such as East Mountain News, South Valley Ink, etc.)
Church and school publications
Retail publications

Public service print – Print publications in smaller communities will often run ads on a pro bono basis, provided the ads are camera-ready.

Community Outreach
Additionally, some **organizations** that serve the specific areas should be identified and engaged. Fruitful liaisons should be established with organizations such as the Middle Rio Grande Conservancy District, SWOP, East Mountain Defense Fund, Friends of the South Valley, neighborhood associations, etc. Access to their mailing lists can give the County additional "reach" toward the target audiences.

MATERIALS AND METHODS

The following are materials and methods that should be utilized in establishing a viable Countywide conservation program. Activities will be phased depending on budget and overall plan. These activities are based on the research and public pulsing conducted at the beginning of this contract. They are based predominantly on what the public has told us they want from the County.

Leadership Engagement
Identify and engage important leadership individuals and organizations in County areas to be targeted. These individuals/organizations might include, but not be limited to former commissioners, legislators, neighborhood association officers, leading citizens in targeted areas, major industries, media personalities, print media editors, civic organizations, etc. The County should co-opt their understanding and support.

Kickoff Event
Conceptualize, organize and conduct a toilet give-away event in the late spring or early summer.

TV and Radio Production
Conceptualize, write, produce and air radio and TV spots, related to the conservation program.

Radio & Television Media Buys
Electronic media will be utilized to heighten public interest re the fragility of the aquifer and the importance of individual responsibility to protect it. Several "flights" of radio and TV spots will be run in two to three week phases during the course of the campaign.

Direct Mail
A second wave of educational activity will include print material direct mailed to as many households as we are able to identify in the "mosaic". This will get the aquifer story, complete with provocative graphics into the hands of individuals in many homes and businesses in the targeted areas. The purpose is to galvanize the public to understand that "What's in it for me?" is a future with adequate water supplies.

Ongoing Public Relations
Develop and place a variety of news stories; organize and follow-up radio and TV interview opportunities; interface with media and research other opportunities; work with neighborhood and other community organizations to disseminate information. Work with County staff to upload pertinent conservation print materials to a website.

Incentive Program Support
Develop a program including PSA's, bill inserts and other tools to support participation in incentive programs, i.e., toilet, landscape, and washing machine rebates and others as they may be developed.

Bill Inserts
Develop, design and produce bill inserts and/or other conservation promotional material for distribution via property tax bills or to customers by cooperating public and private utilities. Maximum finished size is 3.5 inches by 6.5 inches, multiple or single fold. Inserts will be done on approximately a quarterly basis. Utilize overprints of these inserts for distribution to banks, credit unions, shopping centers, cleaners, etc., where public activity is extensive.

Promote Community Gardens
This concept, suggested in public meetings has many potential advantages as described by other communities:
Fosters significant community spirit
Engages all age and interest sectors
Creates possibility of donations of produce to local non-profits or restaurants
Provides possible fund-raising for non-profits
Functions as teaching/training venue on effective landscape management
Provides venue for demonstration of effective irrigation techniques
Minimizes need for individual home gardens, with potential water savings
Could utilize heretofore undesirable municipal space
Adjacency to retirement centers, nursing homes or schools

Community Awards
Recognize those whose water conservation efforts exceed expectations. Conduct a high-profile media event surrounding these awards. Organize and implement one to two awards programs for private and public sector examples of good water conservation. Assume ten awards per year.

Educational Materials
Develop, design and print materials to be used in County schools. Promote special conservation events in the school curricula.

High Water User Initiative

Develop and implement strategy for engaging high water users that have not reduced their use significantly in the conservation effort. Produce materials and distribute as needed to implement strategy.

Print Ads
Develop and place print ads promoting conservation in publications that serve specific targeted regions.

Video Production
Write, direct, produce, distribute and/or air a video detailing fundamental conservation techniques as well as rainwater harvesting systems; residential and commercial conservation opportunities.

Posters/Bumper Stickers
Design, develop and print posters to promote programs.

Billboards
Design, develop, and purchase paper and space for outdoor billboards.

Cooperation with the ABCWUA
It is essential that the County program operate in sync with the ABCWUA's extensive and pervasive conservation program. At the earliest date, County officials should meet with ABCWUA water conservation personnel to identify common promotional opportunities.

Interview Programs
Engage local media to schedule County officials on interview shows to discuss the importance of water conservation and the County's plan to address it.

Project Management
Meet with the Water Conservation Officer and/or other designated County staff on a regular basis, provide ongoing clerical and administrative support, attend other meetings as deemed necessary by the Project Manager, and plan and organize further activities and products.

General media to be engaged for public relations support and for purchased as well as pro bono time:

Print

Associated Press	Albuquerque Journal
Albuquerque Tribune	*Crosswinds Weekly*
El Hispano	*New Mexico Business Journal*
New Mexico Business Weekly	*Weekly Alibi*

TV Stations

KASA TV	KNME TV
KOAT TV	KOB TV
KRQE TV	KLUZ TV

AM Stations

KABQ 1350 AM
KANM 1600 AM
KARS 860 AM
KCQL 1340 AM
KDAZ 730 AM
KKIM 1000 AM
KKJY 1550 AM
KNML 610 AM
KTBL 1050 AM

FM Stations

KABQ 98.5 FM
KAJZ 105.1 FM
KANW 89.1 FM
KAZX 102.9 FM
KBQI 107.9 FM
KBZU 96.3 FM
KDAG 96.9 FM
KFLQ 91.5 FM
KFMQ 106.1 FM
KFXR 107.3 FM
KGLX 99.1 FM
KHFM 95.5 FM
KIOT 102.5 FM
KJAZ 101.7 FM
KJFA 101.3 FM
KKFG 104.5 FM
KKOB 93.3 FM
KKSS 97.3 FM
KLSK 98.1 FM
KLVO 97.7 FM
KLYT 88.3 FM
KMGA 99.5 FM
KNKT 107.1 FM
KPEK 100.3 FM
KSSQ 101.1 FM
KRST 92.3 FM
KRZY 105.9 FM
KSYU 95.1 FM
KTEG 107.9 FM
KTRA 102.1 FM
KTZO 103.3 FM
KUNM 89.9 FM
KYLZ 106.3 FM
KZNM 106.7 FM
KXTC 99.9 FM
KZRR 94.1 FM

TARGETING THE PLANNING AREAS

As described earlier in this plan, a Countywide mass media campaign will provide the general "context" for more surgically targeted message activities. That is to say, while general radio/TV, outdoor messages are communicated to the entire County focusing on fundamental conservation information, there will be a **specific**, **targeted** communication approach in each of the planning areas. This approach will be tailored to the particular qualities of each area: general attitudes, water source, traditional water use, cultural sensitivities, issues identified in the public meetings, ethnicity, etc.

The following are profiles of each planning area, including general demographics, water sources, principal organizations, local media and recommendations on localized communication approaches.

EAST MOUNTAINS (North and South)

Characteristics

The North section of the East Mountains has a southern boundary just South of I-40 (the boundary is based on MRCOG demographic data). This area has a population of 13,050 (73 percent of total for East Mountains). The total number of households is 5,191. Average household size for the North East Mountains is 2.5 persons. Fifty seven percent of the population is served by a utility. The remainder of the population are assumed to be on domestic wells, with a small percentage using water haulers, most likely to

supplement their water supply. Most businesses are located along the corridors of NM 14, or old U.S. 66. Businesses are primarily restaurants, convenience stores, and retail. The cement plant in Tijeras Canyon (unincorporated Bernalillo County) employs about 100 persons, but no other significant industrial sites are in the study area. San Antonio, Sandia Park, Sedillo, and Carnuel are small communities found in this study area. The proportion of multi-family units is 16 percent, as compared to the County average of 27 percent. The density is 0.3 people per acre. This portion of the East Mountains is wealthier than the Southern section, as 96 percent of the population has income weighted in the upper three quintiles of income, ranging from approximately $33,000 to $130,000. Average household size is 2.5. The village of Tijeras is incorporated, and is not included in the study area.

The utility serving the largest number of customers in the area is Entranosa with 4,623 customers. In addition, the area is served by 11 other small water utilities with a combined total of 2,899 customers.

The South Section of the East Mountains has a population of 4,854 (27 percent of total for East Mountains). The total number of households is 1,863. Average household size for the South East Mountains is 2.6 persons. Seventy nine percent of the population is estimated to use domestic wells as their primary water source. The remaining portion obtain water from one of five small utilities. The South East Mountain study area contains small communities such as Chilili, Juan Tomas, Escobosa, Ponderosa Pine, and Cedro. Lots in this area tend to be smaller than those found in the North section of the East Mountains. Most business are located along the corridors of highway 337 (formerly route 14), or old U.S. 66. Businesses are primarily restaurants, convenience stores and retail. This study area contains no multi-family units. The density is 0.09 people per acre. This portion of the East Mountains is relatively less wealthy than the Northern section of the East Mountains, as 92 percent of the population has income weighted in the lower three quintiles of income, approximately $14,000 to $42,000.

The following information applies to the North and South sections of the East Mountains. A majority of residents commute to Albuquerque daily for jobs and shopping. In 1990, the mix of conventional single-family homes versus mobile homes was 80 to 20 percent. About 90 percent of the homes are owned and 10 percent rented.

Some residents rely on or supplement their water supply by paying water haulers to deliver water to their property; however, there is no accurate head count of residents who rely on hauled water. A growing number of residents require supplemental water to augment their poorly producing wells. Many East Mountain residents have experienced dropping well levels, some as much as a couple of hundred feet and some running dry, requiring residents to drill new wells.

Given the shared values between the North and South sections of the East Mountains, the communications approach to the two areas have been combined. Principal issues as articulated by those in attendance at the County's public meeting on conservation are as follows.

Principal Concerns/Issues:

Running out of water
Excessive growth
New developers and golf courses
Lower-density housing
Tiered rates
Landscape restrictions
Discounts for water efficient appliances
Tougher ordinances
Code enforcement
Forest Service cooperation

Utilities

In the North East Mountains

Forest Park Property Owners Co-op
Fox Hills Water Users Association
Independent Utility Company
Juan Road Water System
Mountain View Mobile Home Park
Old Sandia Park Service Co-op
Riviera de Sandia Mobile Home Park
Sierra Vista Mutual Domestic Ass'n
Sierra Vista South Water Co-op
Tijeras Land Estates Water System
Vista Bonita Water Co-op
Entranosa Water & Wastewater Ass'n

In the South East Mountains

Bearcat Homeowners Association
Tranquilo Pines Water Users Co-op
Entranosa Water & Wastewater Ass'n
Chilili Water Users Association
Vista de Manana

Neighborhood Associations/Civic Organizations

Heatherland Hills Landowners
Rincon Loop
Sandia Park Scenic Byway
East Mountain Coalition
Horseshoe Valley Landowners
Sabino Canyon
Sierra Vista Estates

COMMUNICATION ACTIVITIES:

- **Craft messages to acknowledge independent spirit**
- **Emphasize that water conservation can extend the life of supply**
- **Link messages to strong ecological commitment in area (land, wildlife, water)**
- **Engage all merchants on north and south Rte 14 for distribution of print materials**
- **Work closely with East Mountain Coalition**
- **Form collaborative relationships with private utilities and Entranosa**
- **Display conservation materials at community events, rodeos, etc.**
- **Engage local print media**
- **Engage local churches and neighborhood associations**
- **Utilize neighborhood newsletters**

- **Collaborate with Forest Service to explore mutual conservation activities**
- **Identify and engage major developers to assure conservation commitment**
- **Conduct workshops on well management**
- **Establish conservation curriculum in local schools**

Local media to be tapped for message distribution:

Mountain View Telegraph	*The Independent*
Neighborhood newsletters	Comcast

PARADISE HILLS

Characteristics

This area was the earliest urbanized area outside the Albuquerque metropolitan area, now surrounded by the City of Albuquerque. This area is located between Albuquerque and the City of Rio Rancho, with the community of Corrales located to the northeast. Paradise Hills is in the North West corner of the County. Homes are in the 35 to 40 year old range, and landscaping reflects an earlier era in which water conservation was not a priority, although some homes have converted to xeriscape. The average home sale price is $158,927. Average household size is 2.6 persons. Household income levels range from $42,000 to $130,000 per year. Homes are typically in subdivisions. Multi-family units[1] in this area make up about 20 percent of the residential area.

A majority of homes and businesses in Paradise Hills are served by New Mexico Utilities. Sixty percent of the Utility's water is delivered to its 5,787 residential customers. The remainder is directed to community centers, soccer parks, a golf course (roughly 8 percent of the water), shopping, and services. (NM Utilities, 2005)

Principal Concerns/Issues:

Dropping water levels	Loss of water rights
Golf courses	Rate equity
Newer technology	County cooperation w. utilities
County monitoring their wells	Fear possible change of allotments

Neighborhood Associations/Civic Organizations

Westside Coalition of Neighborhoods
Paradise Hills Civic Association

COMMUNICATION ACTIVITIES

- **Craft messages acknowledging subdivision's history as a "first"**

[1] The definition of multi-family units means a residential account with multiple dwellings. Utilities differ in their definition of a multi-family unit, some starting at three units, some at six units or greater.

- **Establish close working relationship with New Mexico Utilities to utilize bill inserts and to plan joint activities such as workshops on xeriscaping, irrigation techniques, etc.**
- **Display conservation materials at community events**
- **Engage local churches and neighborhood associations**
- **Utilize neighborhood newsletters**
- **Consider outdoor boards for conservation messages**
- **Promote series on conservation through print media in area**
- **Establish conservation curriculum in schools**
- **Establish working relationship with country club**

Localized media to be tapped for message distribution:

Clear Channel Outdoor Advertising
Albuquerque Westside Journal
Rio Rancho Journal
Rio Rancho Observer
Neighborhood newsletters
Comcast

NORTH ALBUQUERQUE ACRES/SANDIA HEIGHTS

Characteristics

NAA/Sandia Heights is located in the foothills region of the County, West of the Sandia Mountains, in the North East corner of the County. In the entire NAA/SH area it is estimated that 34 percent of the residents use wells. The study area includes some scattered retail and little or no industry. The average home price is $420,000. Household income ranges from $54,000 to $130,000. Population in the area is approximately 9,405. The average household size is 2.5 persons. About 8 percent of the residences in this sector are multi-family units. The two neighborhoods are briefly described in the paragraphs below.

Sandia Heights has primarily older homes, which are, for the most part, pueblo-style with native landscaping. Some subdivision covenants in this part of the study area require climate-adapted landscaping, and one subdivision has rather lush lawns. SPU serves most of the residents in Sandia Heights (94 percent), with four other smaller utilities serving only 3 percent and ABCWUA providing water to 1 percent. The average residential GPCD for SPU customers is 131. Because one subdivision requires lawns, it drives the average GPCD number higher for the entire subdivision.

Almost all NAA residents use domestic wells as their water source. Ornamental water features such as small ponds and fountains are not uncommon in the NAA study area. Most homes in NAA (60 to 70 percent) are newer, with big lots. There are some NAA subdivisions with covenants requiring the use of deciduous trees, shrubs, and bluegrass in their yards.

Principal Concerns/Issues:

Compacts with other states
Ignorance and Apathy
Lack of incentives
Need to lobby PRC to implement conservation through private utilities

Utilities (population served: 5,893)

Oakland Heights Homeowners Association (29)
Tierra Monte Water Users Association (63)
Sandia Peak Utility (5,626)
Sunset Hills Estates HOA (75)
Ventura Estates (100)

Neighborhood Associations/Civic Organizations

North Albuquerque Acres
Nor Este Neighborhood
North Albuquerque Acres Community
The Quail Springs Neighborhood
Vineyard Estates Neighborhood
Eagle Point Homeowners
North Domingo Baca
Pleasant View Mobile Home
Sonora Homeowners

COMMUNICATION ACTIVITIES

- **As an area with high education levels, emphasize environmental messages**
- **Establish working relationships with the private utilities in area, especially Sandia Peak Utility**
- **Work closely with the churches and neighborhoods**
- **Utilize neighborhood newsletters**
- **Engage commercial entities on Tramway for material distribution**
- **Establish conservation curriculum in schools**
- **Identify and collaborate with key developers**
- **Conduct workshops on well management**

Localized media to be tapped for message distribution:

Clear Channel Outdoor Advertising
Neighborhood newsletters
Albuquerque Journal
Comcast

NORTH VALLEY

Characteristics

The North Valley study area has a population of about 20,000 residents living in about 8,000 dwellings with average household size of 2.5 persons. Multi-family housing accounts for about 1,000 or 12 percent of those households. The average water use for all utility customers is 97 GPCD. However, some residents have private wells for irrigation in addition to ABCWUA water for indoor use. Some residents use Middle Rio Grande

Conservancy District (MRGCD) ditches as a water supply for irrigation (1,275 parcels). Valley residents could have a combination of three different water supplies. Therefore, since other sources are used for outdoor water, the GPCD is considered to be a low number, and not reflective of actual overall water use.

North Valley neighborhoods range from developed subdivisions to clusters of widely divergent housing sizes, lot sizes, and water uses. The North Valley has areas of small ranches with livestock that includes horses, buffalo, and other large animals. The average home sale price is $201,598. North Valley residents' income is distributed across the five income quintiles, from $14,000 to $130,000.

The North Valley has a very strong preservation ethic – preservation of a traditional way of life, agricultural heritage, and its remoteness and ecology. The neighborhood associations are vocal and involved. Many residents can trace their lineage to the earliest settlement of the Valley. Those who have moved to the North Valley tend to support preservation of the rural ambience and strongly oppose new development.

Village of Los Ranchos de Albuquerque

The Village of Los Ranchos de Albuquerque is included as part of the North Valley study area, at the request of the Village. The Village was formed under the laws of the State of New Mexico on December 29, 1958, and is an incorporated municipality located within the North Valley study area. Surrounded by Albuquerque, the Village covers about 2,500 acres, 123 of which are used for commercial purposes. Although parts of the Village have changed from open space and agricultural usage to residential development, a very strong sense of community and commitment toward maintaining the area's rural character are Village hallmarks. The Village has tripled in population since 1970. According to 1999 Census Bureau information, 51 percent of residents are employed in management and professional services, 25 percent in sales and office occupations, and 0.6 percent whose primary income is from agriculture. The median household income in 1999 was $60,500.

Principal Concerns/Issues:

County's "setting us up" to put meters on wells	More regulation
Choices in water conservation	More green space and larger lots
Enforcement of existing ordinances	Property tax incentives
Develop a community garden	Drought plan with "teeth"

Utilities (Population served: 1,479)

Coronado Village Country Club (900)	Green Acres Mobile Home Village (150)
Homestead Mobile Home Community (189)	North Court Mobile Home Park (100)
Valle Grande Mobile Home Park (80)	

Neighborhood Associations

North Valley Coalition	Alameda North Valley

Alvarado Gardens
Los Duranes
Monkbridge Gardens Neighborhood
Near North Valley
Rio Grande Compound Homeowners
Thomas Village Patio Homeowners
Los Griegos
Los Jardines Homeowners
Matthew Meadow Homeowners
Rio Grande Boulevard
Thomas Village

COMMUNICATION ACTIVITIES

- **Link messages to cultural values**
- **Emphasize connection between conservation and "greenbelt"**
- **Utilize bilingual communications where practical**
- **Establish effective collaboration with private utilities**
- **Develop and place outdoor boards in strategic areas with conservation**
- **Engage commercial centers for message distribution, such as the Los Ranchos 4th Street Business Association**
- **Conduct irrigation and well management workshops**
- **Establish conservation curriculum in schools**
- **Utilize print media for message dissemination**
- **Establish effective communication with key developers**
- **Utilize community events in Los Ranchos to reach citizenry, such as: Growers Market, Independence Day, Springfest**

Localized media to be tapped for message distribution:

Clear Channel Outdoor Advertising
Comcast
Albuquerque Westside Journal
Neighborhood newsletters

SOUTH VALLEY

Characteristics

The South Valley study area has a population of about 46,000 residents living in about 15,000 households with an average household size of 3.0 persons. 95 percent of the population have incomes in the lower three quintiles of income, from $14,000 to $42,000. There are approximately 1,100 multi-family housing accounts[2]. Approximately 9,000 households have water connections from the ABCWUA. Smaller water systems account for about 700 connections, and domestic wells are estimated to provide water for the remainder, about 5,500 homes. Many of these wells serve more than one family. As in the North Valley, many of the South Valley residents receive MRGCD water for irrigation (1,679 parcels). The average for utility customers is 109 gallons GPCD. Valley residents could use a combination of three sources of supply, MRGCD surface

[2] Number of units per account varies by utility.

water, domestic wells and ABCWUA water for indoor use, therefore the GPCD probably errs on the low side.

The South Valley is one of the oldest areas in Bernalillo County, and many families trace their lineage to the earliest settlers in the region, whose livelihoods were directly tied to the land and the river. The area was predominantly agricultural until the early 1940s. As such, domestic wells and/or irrigation water provided by the MRGCD have been the principal sources of water for decades. However, agricultural acreage has steadily decreased as the land has been transformed to residential, commercial, and manufacturing uses. Many areas are rural, with small (often less than five acres) farmsteads devoted to growing crops, raising chickens, or grazing horses and cows. A large group of recent Spanish-speaking immigrant (exact population is unknown) may require bilingual materials, and might not be as familiar with water conservation outreach and concepts. This study area has the largest number of commercial and manufacturing enterprises. Cement plants, brick manufacturers, oil and gas tanks, railroad yards, a massive auto storage center, automobile recycling, and the ABCWUA's Southside Water Reclamation Plant are located along Second Street on the east side of the river.

Principal Concerns/Issues:

Conservation costs money
Preserving farmland
Minimize high-density housing
Financial incentives

Utilities: (population served: 2,032)

Bakers Mobile Home Park (200)
Barcelona Mobile Home Park (350)
Desert Palms Mobile Home Park (210)
Hamilton Mobile Home Park (112)
La Mesa Villa Mobile Home Park (85)
Mountain View Mobile Home Park (90)
Paakwereee Village Water Co-op (46)
Lisa Property Water System (50)
Safariland Mobile Home Park (40)
South Hills Water Company (560)
Sunset Mobile Home Park (180)
Tom's Mobile Home Park (49)
Western Terrace II (60)

Neighborhood Associations/Civic Organizations

South Valley Coalition
Alamosa Desert Spring Flower
Route 66 West
Stinson Tower
Westgate Heights
South Valley Small Business Development Center
Southwest Alliance
Encanto Village
Skyview West
Vista Sandia Homeowners
Westgate Vecinos

COMMUNICATION ACTIVITIES

- **Emphasize cultural values in conservation messages**
- **Focus on cost-saving aspects of conservation**
- **Utilize bilingual activities on a selective basis**
- **Conduct irrigation and well management workshops**

- **Collaborate closely with MRGCD**
- **Work through churches and neighborhood associations**
- **Utilize neighborhood newsletters**
- **Place messages on Spanish language radio and TV**
- **Utilize outdoor boards in area**
- **Develop conservation curricula for schools**

Localized media to be tapped for message distribution:

Clear Channel Outdoor Advertising
South Valley Ink
Comcast
Albuquerque Westside Journal
Neighborhood newsletters

SOUTH WEST MESA

Characteristics

The South West Mesa study area is the South Eastern most corner of unincorporated Bernalillo County. This study area has a population of about 7,000 residents living in about 2,300 households with an average household size of 3.2. The South West Mesa is relatively less well off, as 94 percent of the population have incomes in the lower three income quintiles, from $14,000 to $42,000. There are 16 multi-family housing utility accounts. The average water use for utility customers (all utilities) is about 114 GPCD. Only 159 households have water connections from the ABCWUA. Smaller water systems account for almost 400 connections, thirty one parcels receive MRGCD water and domestic wells are estimated to provide water for 1,700 households, many of which serve more than one family.

The South West Mesa provides affordable housing for many first time homebuyers with new subdivisions being created as development heads west. The average home price is $95,000. This area is seeing explosive growth, particularly on the Southern edge of the County. Landscaping is minimal, in southwest style. Because many homes are new, they contain water conservative fixtures such as faucet aerators and toilets. The characteristics toward the Southern edge of the County are markedly different from the northern portion of the study area where many homes were built decades ago. There are some scattered affluent neighborhoods in this area, and commercial establishments.

Utilities:

(2 small systems)
Lisa Property Water System
Tierra West Estates Mobile Home Park

Neighborhood Associations/Civic Organizations

Westside Coalition
Coors Trail
La Luz Del Sol
Alban Hills
Cottonwood Trails
Las Terrazas

La Luz Landowners
Rancho Sereno
Story Rock Homeowners
Volcano Cliffs Property Owners
Quaker Heights
Riverview Estates
Taylor Rancho
West Central Community Development

COMMUNICATION ACTIVITIES

- **Work closely with neighborhoods, utilizing their meetings & newsletters**
- **Develop conservation curriculum for schools**
- **Collaborate with churches**
- **Place outdoor boards with conservation messages**
- **Utilize commercial centers for message distribution**
- **Cooperate with community water systems**
- **Utilize local print media**
- **Conduct workshops on multi-family water use and well management**
- **Utilize bilingual communications where practical**
- **Place messages on Spanish language radio and TV**
- **Establish cooperative relationships with major developers**

Localized media to be tapped for message distribution

Clear Channel Outdoor Advertising
Comcast
Neighborhood newsletters
Albuquerque Westside Journal
Cable One

APPENDIX D
WATER USAGE, DEMOGRAPHIC, WATER UTILITY, AND DOMESTIC WELL INFORMATION

CURRENT WATER USAGE REPORT
BERNALILLO COUNTY, NM

Prepared for:

Bernalillo County Water Resources Program

Prepared by:

Albuquerque, NM
Office: (505) 884-5050
Fax: (505) 837-6550

March 31, 2006

Document Number: 13531_001_D_001_06.doc

Study Areas

Population Information

Category	North East Mountains	South East Mountains	NAA/ Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Population[1]	13,050	4,854	9,405	6,783	20,067	46,279	7,181	107,619
Ave. HH Size[2]	2.51	2.61	2.53	2.64[3]	2.52	3.01	3.18	2.71
Population on Major Utility	4,623	0	5,789	5,787	15,750	27,454	506	59,313
Percent on Major Utility	35%	0%	62%	85%	78%	59%	7%	55%
Population on other Smaller Utility	2,899	1,023	267	0	579	2,150	1,230	8,148
Percent on Smaller Utilities	22%	21%	3%	0%	3%	5%	17%	8%
Total population on utilities	7,522	1,023	6,056	5,787	16,329	29,604	1,736	67,461
Population on domestic wells (estimate)[4]	5,528	3,831	3,349	996	3,738	16,675	5,445	40,158
Percent on Domestic Wells (estimate)	42%	79%	36%	15%	19%	36%	76%	37%

[1] Population figures from MRCOG, 2005

[2] Average Household Size (HH) was computed by calculating population and HH size by each study area (DASZ) obtained from MRCOG data, summing those totals, and then dividing the total study area population by the total households.

[3] New Mexico utilities uses _____ as an average household size. If that figure is used, GPCD for 2005 is 102. Regardless of GPCD, New Mexico Utilities has shown a 40% decrease in per capita use since 1995.

[4] Population not on a utility

GPCD Table

Category	North East Mountains	South East Mountains	NAA/ Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Utility GPCD[5]	76	54	131	121	97	109	114	105
ABCWUA GPCD					97	97 (9121)	97	
Domestic Well GPCD (estimated from WATERS)[6]	125	125	167	167	167	167	167	155

Volume estimates

Category	North East Mountains	South East Mountains	NAA/ Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Utility Volume	208,660,280	20,163,330	322,724,240	255,582,855	578,128,245	1,177,795,140	72,234,960	2,585,442,825
Volume – Domestic Wells	252,215,000	174,789,375	204,138,295	60,711,180	227,849,790	1,016,424,625	331,899,975	2,271,938,850
Volume - Agricultural								7,355,472,997
Total Volume								12,212,854,672

[5] Average Gallons per capita per day (GPCD) was calculated by using the "Average Household Size" (see definition above) for each study area and applying that average to the utilities that had metered water use data. The utilities populations' GPCD was based on information from the utilities or NMED or OSE data, along with average household size from the (DASZ) MRCOG inputs.

[6] Domestic Well GPCD Given the low sample size, the North East Mountains and South East Mountains well consumption figures were combined (39 records) to produce one GPCD figure. According to WATERS, NEM and SEM study areas include 3 basins. Paradise Hills, West Mesa, North Valley and South Valley were combined (27 records) to produce the second GPCD figure.

Agricultural Use

Category	North East Mountains	South East Mountains	NAA/ Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Number of Agricultural Parcels					1,275	1,679	31	2,985
Avg Amt Water per Parcel								2,464,145
Volume - Agricultural								7,355,472,997.10

Utility and Domestic Well Information

Category	North East Mountains	South East Mountains	NAA/ Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Major[7] Utility name	Entranosa	None	Sandia Peak	NM Utilities	Water Utility Authority	Water Utility Authority	Water Utility Authority	N/A
Estimated[8] Well permits[9]	2,218	1,538	468	Insufficient Data	1,185	1,938	713	6,875
Smaller Utilities[10]	11 utilities	5 utilities	4 utilities	0	5 utilities	14 utilities	2 utilities	n/a

Special notes related to study areas:

North East Mountains & South East Mountains both have low GPCD figures due to three significant factors – 1) Little irrigation – most sites are almost entirely natural vegetation, no farming, etc., 2) This area is known by residents to have well viability issues resulting in frugal use of water, and 3) some residents, more so in the South East Mountains are supplemented by water haulers who did not choose to share their gallons served per population figures. These figures are sometimes significant since a water hauler may bring in water to fill a pool that would have taxed the well too severely.

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[7] Major utility has over 1000 residential connections (Water Utility Authority, NM Utilities, Sandia Peak Utilities, and Entranosa)

[8] Number is derived from population not on major or minor utility, divided by (average household size mulitiplied by estimated number of households per well). The HH/well number was adjusted to ensure that the estimated well permit count falls within the range indicated by the WATERS database. See next footnote for range of possible number of permits.

[9] Range of well permits (based on WATERS); lower end number is those designated as domestic wells in WATERS, and the higher end number is those permits that are probable domestic wells in WATERS

North East Mountains 1732 to 2694
South East Mountains 225 to 1533
NAA/Sandia Heights 173 to 629
Paradise Hills 15 to 130
North Valley 464 to1696
South Valley 527 to 2132
South West Mesa 243 to 961

[10] See table below

North Albuquerque Acres/Sandia Heights is primarily served by Sandia Peak Utility (60%). The GPCD were derived from the Sandia Peak and the other three small utilities totally (63%). The well data is not available – so well users in that area are assumed to use similar amounts GPCD as their immediate neighbors.

Paradise Hills is a fast growing community due to the growth of Ventana Ranch. The GPCD however was based on the figures from NM Utilities which represent nearly 85% of the use in that study area. The well data is not available – so well users in that area are assumed to use similar amounts GPCD as their immediate neighbors.

North Valley, South Valley and SW Mesa areas are each derived from the private utilities data factored by the average household size data collected via MRCOG (DASZ) data.

Smaller Utilities

Study Area	Name of Utility	
North East Mountains	Forest Park Property Owners Coop Fox Hills Water Users Association Independent Utility Company Juan Road Water System Mountain View Mobile Home Park Old Sandia Park Service Coop	Riviera de Sandia Mobile Home Park Sierra Vista Mutual Domestic Association Sierra Vista South Water Coop Tijeras Land Estates Water System Vista Bonita Water Coop
South East Mountains	Bearcat Homeowners Association Chilili Water Users Association Green Ridge Water Coop	Tranquilo Pines Water Users Coop Vista de Manana
NAA/Sandia Heights	Oakland Heights Homeowners Association Sunset Hills Estates HOA	Tierra Monte Water Users Association Ventura Estates
Paradise Hills	None	
North Valley	Chamisa Mobile Home Park Green Acres Mobile Home Village Homestead Mobile Home Community	North Court Mobile Home park Valle Grande Mobile Home Park
South Valley	Barcelona Mobile Home Park Desert Palms Mobile Home Park La Mesa Villa Mobile Home Park, LLC Paakwereee Village Water Co-op Association, Inc. South Hills Water Company (Sunburst Ranch) Sunset Mobile Home Park Western Terrace II	Bakers Mobile Home Park Hamilton Mobile Home Park Western Heights East Mobile Home Park Western Heights West Mobile Home Park Mountain View Mobile Home Park Safariland Mobile Home Park Tom's Mobile Home Park
South West Mesa	Lisa Property Water System	Tierra West Estates Mobile Home Park

Demographic Information

Category	North East Mountains	South East Mountains	NAA/ Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Percent in Income group[11] 1	0%	25%	0%	0%	14%	31%	22%	13%
Percent in Income group 2	4%	25%	0%	0%	26%	32%	33%	17%
Percent in Income group 3	25%	42%	0%	0%	23%	32%	39%	23%
Percent in Income group 4	46%	8%	0%	30%	11%	3%	6%	15%
Percent in Income group 5	25%	0%	100%	70%	26%	2%	0%	32%

Comparison of Other Cities with Bernalillo County Study Areas

Location	Population	Residential Water Use GPCD	Avg HH Size	Avg HH Use per Day Gallons
Albuquerque	455,000	97	3.06	297
El Paso	563,000	114	3.10	353
Phoenix	1,321,000	165	2.80	462
Rio Rancho	60,000	116	2.70	310
Santa Fe	66,000	111	2.20	244
Bernalillo County Study Areas	107,619	105	2.71	285

[11] Income Group Range:

1	$14,181-$27,538
2	$27,553-$33,875
3	$33,892-$42,426
4	$42,446-$54,327
5	$54,327-$130,284

BERNALILLO COUNTY WATER PROVIDERS

Prepared by Smart Use, LLC

January 2006

Water Providers in Bernalillo County

(Unincorporated areas - ground water)

File reference: *SU12292005DomWellCount.xls*

12/29/2005

Keys:

Sorted by: System Type

Major Water Suppliers are highlighted in yellow

Produced By: Weston (Smart Use) 9/8/2005

Note: Wherever possible #'s refer to residential only

Study Area

NEM -- Northeast Mountains
SEM - Southeast Mountains
NAA -- North Albuquerque Acres
NV -- North Valley
PH -- Paradise Hills
SV(WM) -- South Valley (West Mesa)

Water System Types

C = Community Water System
NC = Non community (serves less than 25 people)
NTNC = Non transient, non community = (businesses)

Process for Estimation

Source Guide

E1 = Estimate by researcher
U1 = Utility Contact
U2 = Utility Partial Site
S1 = Office of State Eng
S2 = NM Env. Dept
S3 = NM Public Reg. Comm.

WATER SYSTEM NAME	STUDY AREA	SYSTEM TYPE	POPULATION (# of People)	ANNUAL GALLONS	AVG DAILY GALLONS	GALLONS/ PERSON/DAY	DATA SOURCE
OAKLAND HEIGHTS HOMEOWNERS ASSOCIATION	NAA	C	*29*	1,817,700	4,980	172	S2
SANDIA PEAK UTILITY	NAA	C	5626	*821,396*	2,250	131	U1
SUNSET HILLS ESTATES HOA	NAA	C	75	3,285,000	9,000	120	E1
TIERRA MONTE WATER USERS ASSOCIATION	NAA	C	*63*	2,759,400	7,560	120	E1
VENTURA ESTATES	NAA	C	*100*	4,380,000	12,000	120	E1
WATER AUTHORITY	NAA	C	*95*	--	--	--	--
ELENA GALLEGOS PICNIC AREA	NAA	NC		0	0	Non Res	S2
ST. CHADS EPISCOPAL CHURCH	NAA	NC		0	0	Non Res	S2

Population on Utilities	5988					
Population in Study Area	9405	Ave. HH Size	Ave HH/Well	Estimated Wells	WATERS DW	WATERS PDW
Estimated Population on Wells	3417	2.5	3	456	173	629
Major Utility Pop	5721					
Minor Utililty Pop	267					

WATER SYSTEM NAME	STUDY AREA	SYSTEM TYPE	POPULATION (# of People)	ANNUAL GALLONS	AVG DAILY GALLONS	GALLONS/ PERSON/DAY	DATA SOURCE
AMERICAN WATER HAULING	NEM	C		*Not provided*	*Not provided*	*Not provided*	U1
ENTRANOSA WATER UTILITY	NEM	C	4605	*127,512,000*	349,348	76	U1
FOREST PARK PROPERTY OWNERS COOP	NEM	C	164	3,650,000	10,000	61	S2
FOX HILLS WATER USERS ASSOC	NEM	C	69	1,580,450	4,330	63	S2
INDEPENDENT UTILITY COMPANY	NEM	C	1260	*35,000,000*	95,890	76	S3
JUAN ROAD WATER SYSTEM	NEM	C	34	1,095,000	3,000	88	S2
MOUNTAIN VIEW MOBILE HOME PARK (TIJERAS)	NEM	C	79	1,960,780	5,372	68	E1
OLD SANDIA PARK SERVICE CO-OP	NEM	C	200	4,964,000	13,600	68	E1
RIVIERA DE SANDIA MOBILE HOME PARK	NEM	C	392	9,729,440	26,656	68	E1
SIERRA VISTA MUTUAL DOMESTIC ASSOCIATION	NEM	C	*234*	*11,530,350*	31,590	135	U1
SIERRA VISTA SOUTH WATER COOP	NEM	C	*263*	*4,900,074*	13,425	51	U1
TIJERAS LAND ESTATES WATER SYSTEM	NEM	C	*100*	*5,329,000*	14,600	146	U1
VISTA BONITA WATER COOP	NEM	C	*104*	*2,000,000*	5,479	53	U1
BURGER BOY	NEM	NC		0	0	Non Res	S2
CANONCITO GROCERY STORE	NEM	NC		365,000	1,000	Non Res	S2
CAROLINO CANYON	NEM	NC		0	0	Non Res	S2
CEDAR CREST CHEVRON	NEM	NC		0	0	Non Res	S2
EAST MOUNTAIN CHEVRON	SEM	NC		0	0	Non Res	S2
HIDDEN VALLEY RESORT ON ROUTE 66	NEM	NC		0	0	Non Res	S2
MOLLYS BAR	NEM	NC		0	0	Non Res	S2
MOUNTAIN CHRISTIAN CHURCH	NEM	NC		2,190,000	6,000	Non Res	S2
MOUNTAINSIDE UNITED METHODIST	NEM	NC		0	0	Non Res	S2
SANDIA PEAK SKI AREA	NEM	NC		0	0	Non Res	S2
THE PLAZA AT SANDIA PARK, LLC	NEM	NC		0	0	Non Res	S2
TOM & JERRY PLAZA	NEM	NC		638,750	1,750	Non Res	S2
TURQUOISE TRAIL CAMPGROUND	NEM	NC		730,000	2,000	Non Res	S2
TURQUOISE TRAIL WATER SYSTEM	NEM	NC		202,635,225	555,165	Non Res	S2
AMERICAN GYPSUM COMPANY (ABQ PLANT)	NEM	NTNC		*72,150,000*	197,671	Non Res	U1
CEDAR CREST COMMERCIAL WUA INC	NEM	NTNC		0	0	Non Res	S2
SANDIA PARK CENTER (old Bella Vista Restaurant Site)	NEM	NTNC		730,000	2,000	Non Res	S2
VILLA SANTA MARIA	NEM	NTNC		1,241,000	3,400	Non Res	S2

Population on Utilities	7504					
Population in Study Area	13050	Ave. HH Size	Ave. HH/Well	Estimated Wells	WATERS DW	WATERS PDW
Estimated Population on Wells	5546	2.5	1	2,218	1,732	2,694
Major Utility Pop	4605					
Minor Utililty Pop	2899					

WATER SYSTEM NAME	STUDY AREA	SYSTEM TYPE	POPULATION (# of People)	ANNUAL GALLONS	AVG DAILY GALLONS	GALLONS/ PERSON/DAY	DATA SOURCE
CHAMISA MOBILE HOME PARK	NV	C	60	2,430,900	6,660	111	E1
CORONADO VILLAGE COUNTRY CLUB MHP	NV	C	900	*28,908,000*	79,200	88	U2
GREEN ACRES MOBILE HOME VILLAGE	NV	C	150	5,475,000	15,000	100	S2
HOMESTEAD MOBILE HOME COMMUNITY	NV	C	189	7,657,335	20,979	111	E1
NORTH COURT MOBILE HOME PARK	NV	C	100	3,041,545	8,333	83	S2
VALLE GRANDE MOBILE HOME PARK	NV	C	*80*	5,000,500	13,700	171	S2
ALBUQUERQUE WATER UTILITY	NV	C	5848	--	--	--	--
NORTHDALE SHOPPING CENTER	NV	NTNC		0	0	Non Res	S2

Population on Utilities	7327					
Population in Study Area	20067	Ave. HH Size	Ave. HH/Well	Estimated Wells	WATERS DW	WATERS PDW
Estimated Population on Wells	12740	2.5	1	5,096	464	1,696
Population on Minor Utilities	1479				2.63	

WATER SYSTEM NAME	STUDY AREA	SYSTEM TYPE	POPULATION (# of People)	ANNUAL GALLONS	AVG DAILY GALLONS	GALLONS/ PERSON/DAY	DATA SOURCE
NEW MEXICO UTILITIES INC	PH	C	*5787*	*700,227*	1,918	121	U1

Population on Utilities	5787					
Population in Study Area	6783	Ave. HH Size	Ave. HH/Well	Estimated Wells	WATERS DW	WATERS PDW
Estimated Population on Wells	996	2.6	1	383	15	130

WATER SYSTEM NAME	STUDY AREA	SYSTEM TYPE	POPULATION (# of People)	ANNUAL GALLONS	AVG DAILY GALLONS	GALLONS/ PERSON/DAY	DATA SOURCE
BEARCAT HOMEOWNERS ASSOCIATION	SEM	C	55	*1,512,000*	4,142	75	U1
CHILILI WATER USERS ASSN	SEM	C	*78*	1992900	5,460	70	U1
TRANQUILLO PINES WATER USERS COOP	SEM	C	*671*	*12,000,000*	32,877	49	U1
VISTA DE MANANA	SEM	C	50	1,460,000	4,000	80	S2
GREEN RIDGE WATER COOP	SEM	C	169	2,340,000	6,494	33	U1
FOREST MEADOW BAPTIST CHURCH	SEM	NC		0	0	Non Res	S2
PONDEROSA RESTAURANT	SEM	NC		0	0	Non Res	S2
STARFIRE DAY CAMP	SEM	NC		3,153,600	8,640	Non Res	S2
GCC RIO GRANDE	SEM	NTNC		730,000	2,000	Non Res	S2

Population on Utilities	1023					
Population in Study Area	4854	Ave. HH Size	Ave. HH/Well	Estimated Wells	WATERS DW	WATERS PDW
Estimated Population on Wells	3831	2.6	2	737	255	1,533
		38,170.4	104.5763555			

WATER SYSTEM NAME	STUDY AREA	SYSTEM TYPE	POPULATION (# of People)	ANNUAL GALLONS	AVG DAILY GALLONS	GALLONS/ PERSON/DAY	DATA SOURCE
BARCELONA MOBILE HOME PARK	SV	C	350	*15,330,000*	42,000	120	U1
DESERT PALMS MOBILE HOME PARK	SV	C	210	*3,909,150*	10,710	51	U1
LA MESA VILLA MOBILE HOME PARK, LLC	SV	C	85	*3,319,675*	9,095	107	U1
PAAKWEREE VILLAGE WATER CO-OP ASSOC, INC	SV	C	46	1,712,580	4,692	102	E1
SOUTH HILLS WATER COMPANY (SUNBURST RANCH)	SV	C	560	*18,804,000*	51,518	92	S3
SUNSET MOBILE HOME PARK (ALBQ)	SV	C	180	11,315,000	31,000	172	S2
WESTERN TERRACE II	SV	C	60	2,263,000	6,200	103	S2
BAKERS MOBILE HOME PARK	SV	C	200	*8,833,000*	24,200	121	U1
HAMILTON MOBILE HOME PARK	SV	C	112	4,169,760	11,424	102	E1
WESTERN HEIGHTS EAST MOBILE HOME PARK	SV	C	102	3,700,370	10,138	99	S2
WESTERN HEIGHTS WEST MOBILE HOME PARK	SV	C	66	2,409,000	6,600	100	S2
MOUNTAIN VIEW MOBILE HOME PARK	SV	C	90	*3,810,000*	10,438	116	U1
SAFARILAND MOBILE HOME PARK	SV	C	40	1,489,200	4,080	102	E1
TOMS MOBILE HOME PARK	SV	C	*49*	*1,001,560*	2,744	56	U1
ALBUQUERQUE WATER UTILITY	SV	C	27363	--	--	97	--
MESA DE SHARFI RESTAURANTE	SV	NC		0	0	Non Res	S2
ABUELITA'S #2 LLP	SV	NC		0	0	Non Res	S2
LOS PADILLAS COMMUNITY CENTER	SV	NC		0	0	Non Res	S2
SANDIA OUTDOOR RECREATION CENTER - APS	SV	NC		0	0	Non Res	S2
VALLEY LIVESTOCK AUCTION	SV	NC		0	0	Non Res	S2
JOY JUNCTION	SV	NTNC		0	0	Non Res	S2
CASA ANGELICA	SV	NTNC		2,464,480	6,752	Non Res	S2
FOX MANUFACTURING	SV	NTNC		0	0	Non Res	S2
LOS PADILLAS ELEMENTARY SCHOOL	SV	NTNC		0	0	Non Res	S2
NAZARENE INDIAN BIBLE COLLEGE	SV	NTNC		0	0	Non Res	S2
PAJARITO SENIOR CITIZENS CENTER	SV	NTNC		0	0	Non Res	S2
POLK MIDDLE SCHOOL	SV	NTNC		0	0	Non Res	S2
SOIL AMENDMENT FACLILITY	SV	NTNC		0	0	Non Res	S2
TURQUOISE LODGE	SV	NTNC		0	0	Non Res	S2
TVI SOUTH VALLEY CAMPUS	SV	NTNC		0	0	Non Res	S2

Population on Utilities	29513					
Population in Study Area	46279	Ave. HH Size	Ave. HH/Well	Estimated Wells	WATERS DW	WATERS PDW
Estimated Population on Wells	16766	3.0	3	1,863	527	2,132
Pop on Major Utility	27363					
Pop on Minor Utility	2150					

WATER SYSTEM NAME	STUDY AREA	SYSTEM TYPE	POPULATION (# of People)	ANNUAL GALLONS	AVG DAILY GALLONS	GALLONS/ PERSON/DAY	DATA SOURCE
LISA PROPERTY WATER SYSTEM	SV(WM)	C	50	1,795,800	4,920	98	S2
TIERRA WEST ESTATES MHP	SV(WM)	C	*1180*	*54,268,200*	148,680	126	U1
ALBUQUERQUE WATER UTILITY	SV(WM)	C	509	--	--	--	--
AMERICAN RV PARK	SV(WM)	NC		2,608,290	7,146	Non Res	S2
ENCHANTED TRAILS CAMPGROUND	SV(WM)	NC		0	0	Non Res	S2

Population on Utilities	1739						
Population in Study Area	7181	Ave. HH Size	Ave. HH/Well	Estimated Wells	WATERS DW	WATERS PDW	
Estimated Population on Wells	5442	3.2	2	850	243	961	
Pop on Major Utility	509						
Pop on Minor Utility	1230						

CURRENT AGRICULTURAL USAGE REPORT
BERNALILLO COUNTY, NM

Prepared for:

Bernalillo County Water Resources Program

Prepared by:

Albuquerque, NM
Office: (505) 884-5050
Fax: (505) 837-6550

March 31, 2006

AGRICULTURAL USE

The County examined three study areas[12] that have significant agricultural water use using surface water from the Middle Rio Grande Conservancy District (MRGCD): North Valley, South Valley and South West Mesa. Some county residents in all three areas receive allotments from the MRGCD[13]. MRGCD is a governmental agency that manages and delivers irrigation water. The number of parcels receiving MRGCD water for irrigation (Strech, 2005) is as follows:

South West Mesa:	31
South Valley:	1679
North Valley:	1275
Total:	2985

The MRGCD water delivery system is made up of ditches that are used to deliver surface water to individual properties or parcels, with turn-outs at each property that can be opened for delivery of water. MRGCD has recently undertaken efforts to conserve water, including lining ditches, metering diversions and delivery canals, and adding automatic control gates to dams and canals (BBMP, 2005). In a discussion on agricultural water conservation, the role of the MRGCD system is cited as critical in the surface water/ground water relationship (BBMP, 2005).

A Bureau of Reclamation study (BOR, 1997) examined the amount of acreage for different land uses in the County from 1955 to 1993. The study showed that the amount of irrigated agricultural acreage has declined significantly in Bernalillo County especially in the North Valley, South Valley, and South West Mesa study areas. Further reduction in agricultural acreage since the 1997 BOR report was estimated by visually reviewing 2004 orthophotos and comparing them to the previous data. The technique estimated that in 2004 6,562 acres were being irrigated and 3,214 agricultural acres were not currently being irrigated (Table 1).

[12] The agriculture areas in the East Mountains using acequias were not considered as part of this study.

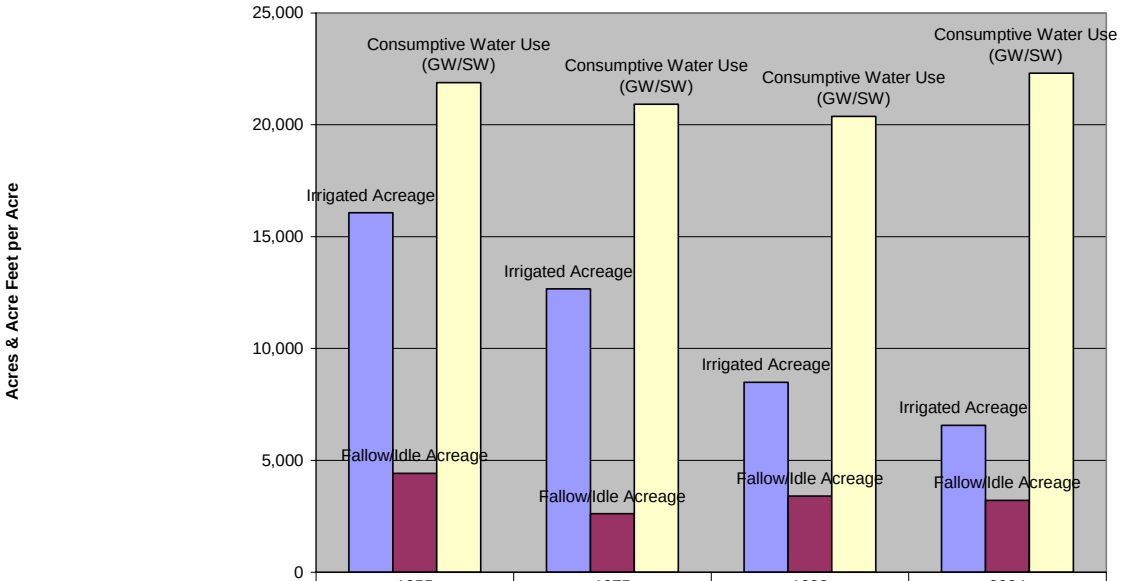
[13] MRGCD water is a property right associated with the land ownership, and those properties with MRGCD rights pay an annual tax to MRGCD.

Table 1. Water Use and Irrigated Acres over time

Year	Area	Irrigated Agricultural Acres	Non-Irrigated Agricultural Acres	Surface Water and Ground Water Consumptive Use for Agriculture in Bernalillo County	Amount of Water in Acre-feet Applied per Acre (Calculated)	Amount of Water Irrigated Agriculture Provides to Deep Percolation (acre-feet/acre)	Amount of Estimated Recharge (acre-feet/acre at rate of 0.7)
1955	Bernalillo County	16,071	4,419	21,893	1.36	0.7	11,250
1975	Bernalillo County	12,667	2,611	20,921	1.65	0.7	8,867
1993	Bernalillo County	8,489	3,397	20,375	2.40	0.7	5,942
2004	Study areas along Rio Grande	6,562	3,214	22,310	3.40 [a]	0.7	4,593
		% Change	% Change	% Change	% Change		
1955-1975		-21	-41	-4	21		
1975-1993		-33	30	-3	45		
1993-2004		-23	-5	9	42		
1955-2004		-59	-27	2	150		

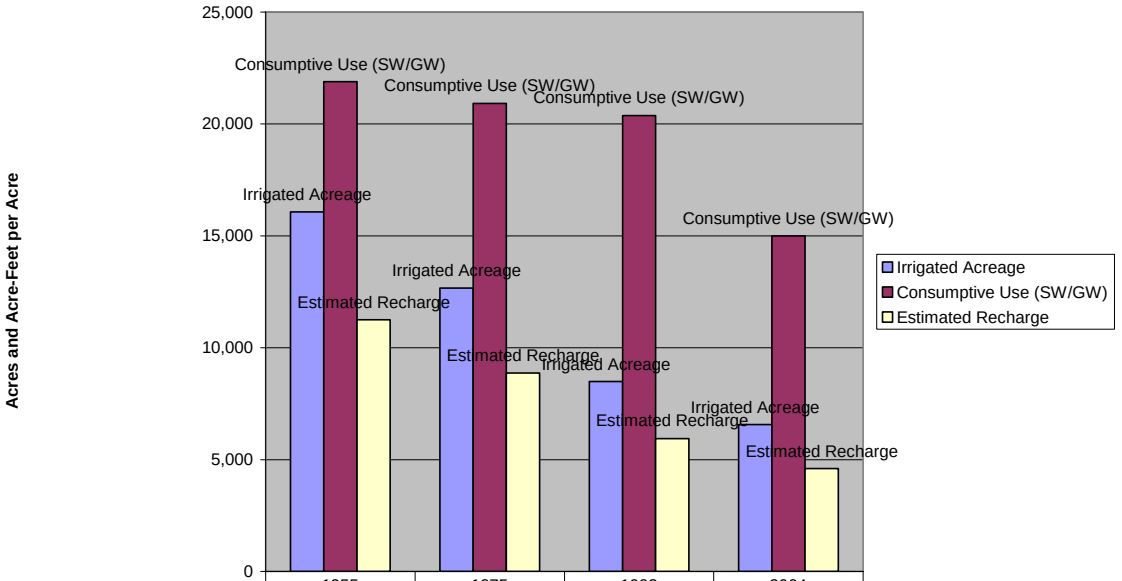
a. Based on 2000 data from MRGCD for amount of water applied.

Source 1955-1993 data: BOR, 1997
Source 2004 acreage data: Weston, 2005



	1955	1975	1993	2004
Irrigated Acreage	16,071	12,667	8,489	6,562
Fallow/Idle Acreage	4,419	2,611	3,397	3,214
Consumptive Water Use (GW/SW)	21,893	20,921	20,375	22,310

Figure 1. Agricultural acreage and water use patterns.



	1955	1975	1993	2004
Irrigated Acreage	16,071	12,667	8,489	6,562
Consumptive Use (SW/GW)	21,893	20,921	20,375	15,000
Estimated Recharge	11,250	8,867	5,942	4,593

Figure 2. Irrigated acreage and water use patterns.

The water applied to crops is drawn into the plant itself, is evaporated from soil into the air (evaporation) or evaporated into the air from the plant (transpiration), or penetrates the soil. The combination is known as evapotranspiration (ET). The rate of ET varies according to the plants themselves, time of day the irrigation water is applied, and weather conditions. Several studies have examined the role of agriculture in ground water, and other studies have looked at the relationship between ground water and the deeper aquifer. The BOR calculated the relationship between applied irrigation water and recharge to the aquifer. According to BOR calculations, irrigated agriculture contributes to the ground water system at a rate of 0.7 acre feet per acre, which is an average across crop types and soil types in central New Mexico. The 0.7 acre feet contributed to the ground water system is what penetrates the ground from the 3.4 acre feet (average) applied per acre. The remainder is used by the plant or lost to ET.

Since the amount of irrigated agricultural acreage has declined over time, the amount of estimated recharge from agriculture has also declined. The 2004 estimate of agricultural acreage and the BOR calculated average of 0.7 acre feet per acre were used to estimate 2004 recharge. An estimated 4,600 acre feet of water was recharged to the aquifer in the Bernalillo County area (from irrigated acreage) in 2004. Details on the amount of recharge from irrigated acres can be found in Appendix D.

Currently, some scientists are working to better understand what happens to ground water beneath ditches and irrigated fields. Some believe that different geologic and soil conditions throughout the valley may prevent ground water from reaching the deep aquifer in some areas. Some scientists also believe that seepage from fields creates a mound in the water table that eventually dissipates and flows back to the river over the course of several weeks when irrigation seasons ends.

The ground water system provides "a principal source of recharge for the deeper aquifer." In a discussion on agricultural water conservation, the role of the MRGCD system is cited as critical in the surface water/ground water relationship (BBMP, 2005).

Several studies have examined the role of agriculture in ground water, and other studies have examined the relationship between ground water and the deeper aquifer. The BOR calculated the relationship between excess applied irrigation water and recharge to the aquifer. According to BOR calculations, irrigated agriculture contributes to the ground water system at a rate of 0.7 acre feet per acre, which is an average across crop types and soil types in central New Mexico. Other estimates come from Natural Resources Conservation Service (NRCS), according to which intake numbers for commonly farmed and irrigated soils in Bernalillo County range from 0.1 to 1.5[14] (NRCS New Mexico Irrigation Guide). A recently published study examining the issue of MRGCD forebearance estimates that 1.38 feet of water are recharged, from an estimated 3.95 feet delivered (King, 2006).

The water delivery system itself, as it is currently configured, loses a certain amount of water to evaporation, seepage below the canals, and transpiration by vegetation along the ditches. The system loss is the same, regardless of how much or how little is used on individual properties[15]. In the water budget calculated by the BOR, canal seepage provides nearly four times the amount of recharge compared to the recharge from the agriculture acreage (0.2 foot per day) (BOR, 1997). The seepage from conveyance channels supports vegetation along the banks, which provides environmental and aesthetic benefits to the community, such as wildlife habitat.

Incentive Program for Agricultural Use

The major difficulty in developing a conservation program for agriculture is that existing state law does not recognize conservation as a beneficial use. Therefore, when agriculture uses water, it is based on a

[14] High intake numbers mean that the soil readily passes water through the profile.

[15] See the section in the Water Conservation Plan on agricultural conservation for a discussion of the role of the legal status of water rights and agricultural use and conservation

water right, which is a property right. That property right is subject to the Office of the State Engineer determination that the water right is being put to beneficial use. Any water right that has not been put to beneficial use for four years can be subject to forfeiture, and would become part of the waters of New Mexico. Therefore, the concept of "use it or lose it" does not currently support conservation by agriculture.

However, if an agricultural user were willing to conserve, and then use that water right to support processing of a value-added crop, such as processing green chile, that would be a way for agricultural users to conserve without losing a water right. If water conservation or in-stream flow were recognized as beneficial use under state law, then the County could potentially support more efficient use of water by supporting adding value to existing crops through the existing small business incubator in the South Valley. (This change would require some pooling of water rights to support the water use for processing in the commercial kitchen that is part of the small business incubator.) Another option is for the County to provide incentives for conversion to more water-efficient and profitable crops, such as lavender. Other options for incentivizing conservation in agriculture are to allow a property tax rebate for conservation measures taken, such as lining ditches or laser leveling of fields. The County could also support on-farm efficiency in conjunction with the MRGCD, whereby MRGCD ratepayers would decrease the amount of irrigation water used and lease that unused water if vested water rights are quantified and protected (BBMP, 2005). Agricultural users over a certain size would have the option to pursue federal funding for assistance with on-farm efficiency.

Background:

Review of available literature:

SS Papadopulos – Middle Rio Grande Water Supply Study – 2000
The Middle Rio Grande is a stream-connected aquifer, which means that the ground water and surface water are expressions of the same system. Pumping ground water from wells borrows water from the flow of the stream. Once pumping ceases, the surface water will flow back to fill in the spaces. There is a time delay, and a limitation of the replenishment of the ground water depending upon the materials of the aquifer. In the Albuquerque area, due to heavy levels of ground water pumping, that system has become disconnected, which causes a delay in the impact pumping has on the river. "In the long term, the ground water resource functions as a regulating reservoir to the region, rather than as a separate source of water." (p. 12) Therefore, although surface water is added to the ground water via excess agricultural application, by conservation of mass, it is not "new" water, but merely water transferred temporarily from the surface water expression to the ground water reservoir. Eventually that water will either supplement the ground water withdrawals via pumping or make its way back to the surface water system, depending upon the location and aquifer materials underneath where the agriculture takes place.

Bureau of Reclamation – Middle Rio Grande Water Assessment, Final Report - 1997
"Surface water diverted for irrigation becomes evapotranspiration, drains back to the Rio Grande, becomes part of the biomass, or infiltrates to become ground water that is either carried off by District drains or moves toward pumping wells in the Albuquerque Basin…. In the vicinity of Albuquerque, deep percolation from irrigated land and seepage from drains, canals, and waste waterways has produced recharge to the ground-water system that has offset, in part, the effects of ground-water withdrawals." (MRGWA Final Report. 1997) The ground water level dropped in 1975 and 1993 in Bernalillo County because of "structural and hydrologic changes in the river and ground water system." (MRGWA Final Report., 1997) Half of the 113,000 acre-feet lost annually primarily in Bernalillo County is recharge

(measured in 1994).[16]" (MRGWA Appendix, 1997) Average annual deep percolation from irrigated lands was calculated to be about 0.7 acre-foot per acre (Cummins 1995).

Irrigation Forbearance Feasibility Study in the Middle Rio Grande Conservancy District – 2005
Approximately 156,000 acre feet per year is estimated to be withdrawn via municipal wells in the Albuquerque area. As a result of the pumping, the formerly stream-connected aquifer has become disconnected in Albuquerque. Conveyance losses are likely returned to the surface water system via the drains. Groundwater withdrawals cause depletions from the Rio Grande. Of an estimated 3.95 feet of water applied to irrigated agriculture (farm delivery requirement), 2.57 feet are the crop irrigation requirement, and 1.38 feet of water are estimated as recharge.

[16] 33,000 acre feet of recharge comes from river channel and riverside drain seepage between Bernalillo and Isleta Pueblo. Approximately32,000 acre-feet of recharge comes from MRGCD project lands and facilities due to canal seepage and irrigation deep percolation. Of that, deep percolation from irrigated fields contributed about 8,000 acre feet to recharge in 1994, while seepage from canals contributed about 23,000 acre feet. Current levels are declining and may be lost as urbanization continues.

APPENDIX E
DATA QUALITY

Data Quality Summary

WELL DATA

The original method proposed to determine domestic well gallons per capita per day (GPCD) for each study area was to assess the "background information" for the Office of the State Engineer's (OSE) 5 year summary data, also known as the Brian Wilson reports. The assumption was that the OSE derived their domestic well GPCD figures by using the metered well use. Upon investigating the basis for the 5 year reports, it was discovered that GPCD for domestic wells is estimated as follows:

> **"For the purpose of estimating withdrawals for the self-supplied domestic population, in most counties an areawide average of 80 GPCD is used. In counties where water requirements for landscape irrigation and evaporative cooling are more prevalent, an areawide average of 100 GPCD is used; and in Catron, Cibola, McKinley, and San Juan counties where a segment of the population does not have indoor running water, an areawide average of 70 GPCD is used" (Wilson, 2003, p. 13)**

The OSE determined the total withdrawal, in acre-feet, from self-supplied domestic wells by subtracting the population served by public water suppliers from the total population in a county. Total withdrawal in acre-feet was computed by:

W = (POP)(GPCD)/892.74
W = withdrawal in acre feet
POP = population
GPCD = gallons per capita per day

The Weston/RTI team determined that the Water Administration Technical Engineering Resource System (WATERS) database would have to be mined in order to find the needed data to develop a GPCD figure for the each study area.

2. Weston provided RTI with a spreadsheet, derived from the OSE's WATERS database as of December 27, 2004, that contained Bernalillo County well permit records falling within the seven study areas. The records in the WATERS database were entered from information provided in well permit applications. The WATERS database for Bernalillo County is still in the development phase; therefore, not all well permits have been entered into the database and georeferencing of well points has not been refined. As such, WATERS cannot be relied upon to provide an accurate count of wells, nor can it be relied upon to accurately locate a well. Other deficiencies were encountered with the WATERS database that affect the quality of the Study Area self-supplied domestic wells GPCD calculations:

a. **Low sample size:** There are 10,375 permit records within the seven study areas in Bernalillo County. Of those records, 66 had domestic well consumption data that could be used for the study. The difficulty with the low sample size is compounded by the inability to accurately determine the physical distribution of these wells. The well records sample size is illustrated in the table below, by study area.

Table 1: Available data for Determining GPCD for Study Areas

Study Area	Well Permits in Study Area (per WATERS)	Classified domestic wells	Wells with consumption data	Wells with Usable Consumption Data	% of Wells with usable consumption data
NAA	647	173	21	14	8%
NEM	2831	1732	90	22	1%
NV	1842	464	14	7	2%
PH	135	15	0	0	0%
SEM	1569	255	31	5	2%
SV	2335	527	26	9	2%
WM	1016	243	22	9	4%
	10,375	3409	204	66	2%

b. **Insufficient recording of withdrawal information:** Approximately 6% of self-supplied domestic wells' withdrawal information is reported and/or documented in the WATERS database. Many records did not appear to have correctly reported withdrawal information.

c. **Uncertainty regarding well type classification:** Out of the 10,375 well permits in the database, 4,070 (39%) are classified. Of those, 3,409 were identified as domestic wells. The caveat here is the coding technique employed by the OSE to describe wells. The use_of_well field does not systematically code categories, resulting in 106 different classifications that could describe a domestic well. (*See Attachment A*). When deriving our well counts for the public meetings, the team used all of the categories.

d. **No information on how many homes are served by a well:** The WATERS database does not track how many (if any) homes are served by a given well permit. Therefore, for the purpose of this study it was assumed that there are three homes per well. This assumption was adjusted where the resulting GPCD figure was not realistic.

Given that no other known data sources exist that could be used to calculate self-supplied domestic well GPCD for each study area, RTI worked with the WATERS data in the following manner:

RTI developed a spreadsheet, DomWells_consumption, which only contained records that contained consumption data. Some of these wells are classified as domestic but others are not classified. Unclassified wells were not eliminated in the event that they could be assigned as domestic. Given the variation in water use over time and the presence of many statistical outliers for the year 2004, well consumption figures for the years 2004-2000 were averaged together in order to develop a 5 year average well use figure (in acre-feet).

The next step was to determine the population being served by a given well, which was achieved by multiplying the number of households served by a well times the average household size for a study area. Since the OSE does not track the number of households per well, it was necessary to assume that 3 households were served per well. Where this assumption resulted in an unrealistic GPCD number, the number was adjusted until a realistic GPCD figure was obtained. When the GPCD figure was still obviously incorrect following this adjustment, the record was dropped from the sample. Household size was determined by dividing population by number of households (data was obtained from the Mid Region Council of Governments, or MRCOG, 2005 projections).

The well use figure was then converted from acre feet to gallons and then divided by the population per well figure. This number was then divided by 365 days to achieve a GPCD figure.

Study_Area_Name	pod_basin	pod_nbr	pod_suffix	Well Category	HH per well	Average HH Size for Study Area	Population per Well (HH per well * HH Size)	5 Year Average (gallons)	Gallons per Year per Capita/well	Gallons per Day per Capita/well	5 Year Average (acreft)
North Albuquerque Acres	RG	57786			1	2.5	2.5	41,122.40	16449	**45**	0.13
North Albuquerque Acres	RG	63741			1	2.5	2.5	39,835.28	15934	**44**	0.12
North Albuquerque Acres	RG	63874		MUL HH	3	2.5	7.5	708,791.10	94505	**259**	2.18
North Albuquerque Acres	RG	62296			3	2.5	7.5	467,270.33	62303	**171**	1.43
North Albuquerque Acres	RG	63205		MUL HH	3	2.5	7.5	670,194.04	89359	**245**	2.06
North Albuquerque Acres	RG	54534			3	2.5	7.5	760,080.04	101344	**278**	2.33
North Albuquerque Acres	RG	60880			2	2.5	5	528,530.32	105706	**290**	1.62
North Albuquerque Acres	RG	57854			3	2.5	7.5	362,889.40	48385	**133**	1.11
North Albuquerque Acres	RG	59746			3	2.5	7.5	353,059.56	47075	**129**	1.08
North Albuquerque Acres	RG	74057		DOM/SAN	3	2.5	7.5	514,844.58	68646	**188**	1.58
North Albuquerque Acres	RG	71830		MUL HH	3	2.5	7.5	238,441.47	31792	**87**	0.73
North Albuquerque Acres	RG	58134			3	2.5	7.5	137,834.97	18378	**50**	0.42
North Albuquerque Acres	RG	58134			3	2.5	7.5	93,845.09	12513	**34**	0.29
North Albuquerque Acres	RG	79208		MUL HH	3	2.5	7.5	964,844.81	128646	**352**	2.961
North Albuquerque Acres	RG	61506		MUL DOM	2	2.5	5	29,000.74	5800	**16**	0.09
North Albuquerque Acres	RG	62063		MUL	2	2.5	5	53,439.56	10688	**29**	0.16
North Albuquerque Acres	RG	57776		MUL	2	2.5	5	72,338.92	14468	**40**	0.22
North Albuquerque Acres	RG	77590		MUL	2	2.5	5	4,887.77	978	**3**	0.02

This procedure was performed for each study area. However, given the low sample size, it was decided that study areas would be aggregated by broad geographic location in order to come up with a better sample size. The North East Mountains and South East Mountains were grouped and North Albuquerque Acres, North Valley, South Valley, and West Mesa were grouped together. (There was no data for Paradise Hills). This aggregated number would be used in instances where the GPCD resulting from the individual study area alone seemed unrealistic or was unavailable; these included the North Valley, South Valley, West Mesa, and Paradise Hills.

DEMOGRAPHIC DATA

The RTI Demographic Data spreadsheet is categorized according to Study Area Boundary and DASZ units, and is comprised from data coming from three sources:

1. MRCOG 2005 Data Analysis Subzones (DASZ) Forecast Data
2. US Census Data, 2000
3. Bernalillo County Shapefiles

The DASZ boundaries were used to create the Study Area boundaries since DASZ units provided the best available demographic data. Areas falling within the City of Albuquerque, the City of Rio Rancho, Village of Tijeras and Tribal lands were clipped out of the study area boundaries.

The quality of the demographic data may be influenced by the following factors:

a. Forecast data was used to determine current population and number of households.

b. Population and number of households data is determined by the DASZ unit.

However, since the DASZ boundaries were clipped to exclude the City of Albuquerque, City of Rio Rancho, Village of Tijeras and Tribal lands, the population and number of households figures for each study area needed to be adjusted. RTI applied a percentage in order to proportionally exclude populations falling outside of the study area boundary. Using a map of the DASZ boundaries, study area boundaries and political boundaries overlaid onto a 2004 orthophoto (in order to see the distribution of development within a DASZ), RTI performed a visual inspection to determine the distribution of population density within a DASZ that falls within the study area versus the distribution of population density within a DASZ that falls outside the study area. This ratio, combined with the acreage ratio of DASZ within study area versus DASZ outside study area, was used to establish the percentage that was applied to the DASZ population figures.

c. Income data is actually from the year 2000.

d. The classification of urban and rural comes from census data, which is reported according to block group, not DASZ. Since these boundaries do not neatly overlap, it was necessary to assign, by visual inspection, each DASZ to a block group. During this process, it was observed that Census classification did not necessarily correspond to known population and household density information. Parcel size or household density would be a more reliable indicator of whether a DASZ is urban or rural.

GPCD DATA

GPCD (Gallons Per Capita per Day) – Development and Calculations Rationale

Note: GPCD figures for utility populations are estimates because multiple sources of information were used with varying levels of accuracy in the figures obtained. However, the figures should provide relative measures for water conservation planning purposes.

North Albuquerque Acres:
Ninety four percent of the population served by utilities was from the Sandia Peak Utility, therefore their average GPCD of 146 was applied to the entire study area.

North East Mountains:
Entranosa Utility provides 35% of the water in the NE Mountains. Eleven smaller utilities provide another 22% of the water. The GPCD average was calculated by adding all of the water provided by utilities (209,251,094 gallons per year), dividing by the utility population of 7504, and then dividing by 365 days.

North Valley:
GPCD was derived from the population of 579 served by private utilities. In order to increase the validity of the GPCD estimate, GPCD averages for 900 people from just east of the study area with very similar living conditions were included. The data for this population came from a utility provider, whereas the other figures came from NMED, which proved to be less reliable information.

Paradise Hills:
GPCD was calculated using total residential gallons pumped for the entire population served by NM Utilities (1,486,242,000 gallons per year) – which includes some City of Albuquerque residents -- divided by the total number of NM Utility residential accounts (12,785) resulting in 116,249 gallons per account per year. Then the MRCOG TAZ Census household size (2.64) for the study area was used to go from accounts to per capita use. The remaining number was divided by 365 days.

South East Mountains:
GPCD was calculated using four small utilities that had a least one year of information (this excluded Green Ridge water coop since it has been in operation less than a year). The four utilities used a combined total of 16,964,900 gallons for the year supporting a population of 854. The gallons used was divided by population and 365 days.

South Valley:
GPCD was developed by combining 14 small utilities use of 82,066,295 gallons per year, dividing by the population served of 2150 and by 365 days per year for 105 GPCD.

South West Mesa:
Two utilities were used to calculate the GPCD in this study area.

TREND DATA

Trend data was derived from MRCOG DASZ forecast data for 2005, 2010, 2015, and 2025, and MRCOG historic data for 2000, 1995 and 1990. Two points should be noted regarding the trend data:

1. DASZ boundaries change over time and significant population changes may require the creation of an entirely new DASZ unit. As a result, the area represented by historic population figures may not exactly correspond to the current area boundaries. Furthermore, some DASZ units from the 2000 Census did not exist in 1995 and 1990. This results in the appearance of a 0 population for some DASZs in 1995 and 1990.

2. The trend data applies the same population ratio of domestic self-supplied domestic well users to public water supply users for 2005 to historic and future conditions.

ATTACHMENT 1

1 HOUSEHOLD
1HH
CLW DOM
COM, DOM, IRR
COM, REC,DOM,ST
COM,DOM,IRR
COM,DOM,STK
COM./DOM
COM/DOM/SAN
DAI, DOM
DDOMESTIC
DOEMSTIC
DOM
DOM & GARDEN
DOM & IRR
DOM & SAN
DOM & SANI
DOM /LIVESTOCK
DOM 1 HH
DOM 7 SAN
DOM AND SAN
DOM AND STOCK
DOM REPAIR
DOM SAN
DOM STK
DOM, COM
DOM, IRR
DOM, MULTI
DOM,IRR
DOM,SAN
DOM-INDUSTRIAL
DOM-MULTI
DOM-SAN
DOM-SAN-COM
DOM-SAN-COM?
DOM.
DOM. 1HH
DOM./SAN.
DOM/CLW
DOM/IRR
DOM/LIV
DOM/LIVESTOCK
DOM/LVSTK
DOM/REPAIR
DOM/SAN
DOM/SANI
DOM/SANI/COMM
DOM/SANI/MULTI
DOM/SANITARY
DOM/SANITATION
DOM/SANTI
DOM/STK
DOM/STOCK
DOM/SUPP
DOM/SUPP.
DOMESTIC
DOMESTIC / DRY
DOMESTIC/DRY
DOMESTIC/MULTI
DOMESTIC/SAN
DOMESTIC/SANI
DOMESTIC/SANI.
DOMSETIC
DPMESTIC
DRNKING/SAN DOM
IND. & DOM
INDUSTRIAL -DOM
INDUSTRIAL-DOM
IRR & DOM
IRR, DOM
IRR, DOM, COM,
IRR,DOM
IRR/DOM
MDW
MDW, IRR
MDWCA
MUL
MUL HH
MUL. HOUSEHOLD
MUL./DOM.
MUL/ DOM.
MUL/DOM
MUL/DOM.
MULT HMS
MULTI
MULTI DOM
MULTI HH
MULTI HOME
MULTI HOUSEHOLD
MULTIPLE
MULTIPLE HH
MULTIPLE HH DOM
MULTIPLE HOUSE
ONE HH
ONE HH & IRRG.
ONE HOUSE
ONE HOUSEHOLD
ONE HOUSEHOLD '
ONE HOUSEHOLD
ONEHOUSEHOLD
REC./DOM
SAN./DOM.
SAN/DOM

1. WATER USE DATA

2. UTILITIES

3. POPULATION AND GPCD DATA WERE OBTAINED FROM THE OSE[17], NMED[18], PRC[19] AND UTILITIES[20] FOR ALL UTILITIES' WATER USAGE. PUMPING/USAGE INFORMATION FOR EACH OF THE UTILITIES WAS OBTAINED FROM THE ABOVE FOUR SOURCES WHERE AVAILABLE. WHERE THIS INFORMATION WAS LACKING, THE EXISTING DATA WAS EXTRAPOLATED WITHIN A STUDY AREA. UTILITY DATA WAS THE DEFAULT. SINCE NMED DATA MATCHED THE UTILITY DATA MORE OFTEN, IN CASES WHERE CONSULTANT UNABLE TO GET IN TOUCH WITH UTILITIES, NMED DATA WAS USED AS THE DEFAULT. GREEN RIDGE WATER COOP WAS NOT LISTED IN OSE, NMED OR PRC, BECAUSE IT WAS NOT OPERATIONAL UNTIL AUGUST 2005, THEREFORE DATA WAS OBTAINED DIRECTLY FROM THE COOP. ENTRANOSA REPORTS DATA TO THE PRC UNDER SANTA FE COUNTY, NOT BERNALILLO COUNTY. THEREFORE, THE DATA WAS OBTAINED DIRECTLY FROM ENTRANOSA.

[17] Public Water Supply and Self-Supplied Domestic. Water systems, population, per capita use, and withdrawals and depletions in acre-feet, in New Mexico counties, 2000.
[18] NMED data came from listing of utilities by county for the State of New Mexico
[19] Annual Report
[20] Written and Phone Survey, Internet research

APPENDIX F
SAMPLE UTILITY QUESTIONNAIRE

Date: April 4, 2005
To: (Contact Name --- Utility Company Name)
From: Laura Ferrary, Smart Use

Here are the questions we have and the names and contact numbers of the people involved in the water conservation study for Bernalillo County. Don't hesitate to call if you have any questions. Thank you for your time.

Bernalillo County Water Conservation Study
Kerry Bassore
Bernalillo County Water and Facilities Technician
848-1552

Lead Contractor: Weston Solutions, Inc.
Steve Wagner – Sr. Vice President
837-6571

Sub-Contractor: Smart Use, LLC
Laura Ferrary 400-4543
Richard Chapman 400-0283
FAX #: 268-1520
llferrary@aol.com

Questions for Water Utility Providers in Bernalillo County

1. What are the specific geographic boundaries of the area served?

2. Are there are sub-geographic areas? Do you have unincorporated and incorporated areas?

3. Total amount of water pumped by month for last three years

4. Total amount billed (dif is UAW) by month for last three years

5. Customers
   - Total number of customers
   - Breakdown of customers by geographic area – incorporated versus unincorporated or any other geographic breakdowns
   - Customers by type (if available) – residential, commercial, industrial, institutional, or other classification

6. Trends – Projections: Do you anticipate significant changes in your customer base, water use, or area served? Please explain.

7. Issues: Are there any other issues related to water use or water conservation?

APPENDIX G
PUBLIC INVOLVEMENT MEETINGS
AND EXISTING WATER SURVEY ANALYSIS

WATER CONSERVATION PLAN

Public Involvement Meetings Report & Existing Water Survey Analysis

Prepared by
Cooney, Watson and Associates
2201 San Pedro NE, Building 3, Suite 240
Albuquerque, NM 87110

March 1, 2006

Table of Contents

Executive Summary

The unincorporated portions of Bernalillo County are home to a very diverse group of water users, including individuals and businesses who get their water from the Albuquerque/ Bernalillo County Water Utility Authority, from domestic or shared wells, or from private utility companies. Some are farmers, some are gardeners, some have large tracts of land, and some have small. Many enjoy the independent way of life the County offers with little or no regulation on their water use.

In 2005, as part of its planning process for a water conservation plan, Bernalillo County sought out these individuals. The purposes were to gather information on their current conservation practices, ask their perspective on barriers to water conservation, and request their ideas and recommendations on what types of programs and incentives Bernalillo County could offer to encourage them to conserve water.

Over the course of six weeks, Bernalillo County scheduled public meetings in five different planning areas. County representatives and consultants met with 118 residents from the North Valley, South Valley, East Mountains, North Albuquerque Acres, Sandia Heights and Paradise Hills planning areas.

At the beginning of each meeting, the group received a brief verbal introduction that explained the purpose of the meeting, and the overall timetable and process that the County would use for completing the water conservation plan. Following the introduction, a customized PowerPoint presentation was presented to each group. Then, as appropriate, the groups were divided into smaller discussion groups to explore three topics:

1) *What are your current water conservation practices?*
2) *What are the biggest obstacles to water conservation?*
3) *How can the County promote water conservation?*

Each topic yielded a long list of comments, concerns and ideas. The most popular water conservation measures that participants are currently practicing include:

- **water harvesting**
- **rain barrels**
- **xeriscaping**
- **low-water-use appliances and fixtures**
- **drip irrigation & efficient watering/sprinkler systems**
- **taking shorter showers**

The biggest obstacles to water conservation identified by the groups included:

- **ignorance and lack of education**
- **apathy and lack of interest**
- **population growth with new housing**
- **lack of incentives (rebates, pricing, etc.)**
- **numerous problems surrounding installation of gray water systems**

The groups had a number of suggestions on what Bernalillo County can do to promote water conservation, including:

- **education programs in schools**

- **general educational programs**
- **incentives (discounts on property taxes, rebates, etc.)**
- **enforcement of existing ordinances**
- **stricter ordinances and standards for new developments**
- **free water audits**
- **new resident packages**
- **proper measurement and management of the area's water resources**

With the exception of Paradise Hills participants, those attending the meetings were also asked to rank 13 different values describing various uses of water in terms of importance. Across the board, they agreed that use of water for existing homes was of greatest importance. Only the South Valley group ranked another use – irrigation for farms – as equally important.

Among uses the groups also deemed very important were watering existing yards and landscaping and irrigation for farms. Ranked as fairly important were providing food and refuge for animals, birds and other wildlife, and preserving the Bosque.

The majority of group participants placed little value on watering golf courses and having swimming pools for individual homes. Also of less importance were new industrial uses, such as manufacturing, and water for yards and landscaping in new developments.

Of medium importance were watering community parks and sports fields, and indoor use for new housing developments. Somewhat less important were cultural and religious uses (such as on Pueblos) and recreational uses such as fishing, rafting, etc.

The public information meetings attracted a variety of individuals with different levels of knowledge about and commitment to water conservation. A number of participants asked questions and provided input. Some requested that the County provide as much information as possible in the months to come – not only about the County's water conservation plan, but about how they can do their part to help the County develop and implement a plan that meets their water needs.

To help assess the information gathered at these meetings, recent survey results that included comparable or relevant issues are also analyzed in this report. These surveys include:

- "Attitudes and Preferences of Residents of the Middle Rio Grande Water Planning Region Regarding Water Issues," by the UNM Institute for Public Policy, University of New Mexico, for the Action Committee of the Middle Rio Grande Water Assembly and the Middle Rio Grande Council of Governments, June 2000

- "Perceptions of Water Quality and Supply in the Unincorporated Areas of Bernalillo County," by the University of New Mexico Bureau of Business and Economic Research, for the Bernalillo County Environmental Health Department, June 2002

- "East Mountain Area Water Survey Final Report," by a Survey Team in the University of New Mexico Department of Community and Regional Planning, Course CRP511, Adelamar Alcantara, PhD, instruction, May 2005

The 2000 survey, while much more comprehensive than the 2005 public meetings, asked somewhat comparable questions about the underground aquifer and long-term water supply concerns. About 70 percent of those respondents believed that over-pumping of the aquifer could affect the water supply, and thus the quality of life, for future generations, although a number of respondents were unsure. This contrasts. Somewhat, with the 2005 public meetings, where the majority of participants were knowledgeable about the over-pumping of the underground aquifer and where most participants agreed water conservation is an important issue.

Both the survey and the meetings asked about "values" rankings of various water uses, with some interesting similarities and differences. In both the 2000 survey and the 2005 meetings, "indoor use in existing homes" was ranked as mot important. Swimming pools were ranked as least important in 2000 and next-to-least important in 2005. The most significant different is that "watering existing yards and landscapes" was ranked at #10 (not very important) in 2000 and #3 (fairly important) in 2005. That difference in ranking may be due, somewhat, to the widespread installation of xeriscapes over the past five years.

The 2002 survey and the 2005 public meetings were somewhat similar in that they divided the study group into very similar planning areas (North Valley, South Valley, North Albuquerque Acres/Sandia Heights or Sandia Foothills, and East Mountains). The area of the 2002 survey that was comparable with the 2005 public meetings was the area that focused on water supply. The importance that each of the groups gave to concerns about water supply was very similar in 2002 and 2005, with the East Mountains and South Valley expressing the most concern, and North Albuquerque Acres/Sandia Heights or Sandia Foothills expressing the least concern.

Both the survey and the meetings showed support for policies that support protection of long-term water supply through education and appropriate policies.

The 2005 East Mountain Survey, which was completed in May 2005, just before the June 2005 East Mountain public information meeting, reported findings which closely correlated with the results of the meeting. The only area of difference was the willingness to implement water conservation measures correlated with the length of residency in the East Mountains. The survey found that long-term (five years or more) residents were less likely to implement water conservation measures than newer residents. At the public meetings, long-term residents reported more implementation of water conservation measures.

Bernalillo County has demonstrated its commitment to an open, honest dialogue on the issue of water conservation through these public meetings. Through this type of dialogue, the County can be assured that it is meeting the needs of its residents, and

that it develops a water conservation plan that is realistic, appropriate, and that can receive public scrutiny, and ultimately public buy-in for successful implementation.

Public Involvement Meetings

Five public involvement meetings were planned and promoted by Bernalillo County. Each meeting was scheduled from approximately 6:30-9:00 p.m. at a convenient meeting location for the specified planning area. Refreshments (water, drinks, and cookies) were served, and participants were asked to sign in. For a list of participants, see *Attachment A.*

The meetings were developed around five different planning areas:

Paradise Hills
Paradise Hills Community Center
May 5, 2005

North Valley
Taylor Middle School
May 19, 2005

North Albuquerque Acres/Sandia Heights
Lieutenant William Sibrava Memorial Substation
June 1, 2005

East Mountains
Los Vecinos Community Center
June 7, 2005

South Valley
Sergeant Julian Jarvaez South Area Command Center
June 16, 2005

The meetings were promoted by the County through post cards to area residents and newspaper ads in area daily and/or weekly newspapers.

The first meeting, held in early May for Paradise Hills residents, attracted the fewest participants. Only seven people attended. The next-to-last meeting, held in early June for East Mountain residents, attracted the biggest turnout, with 57 people attending. Participation at the other three meetings ranged from 11 to 19.

Customized PowerPoint presentations were presented at each meeting *(see Attachment B)*. Following the PowerPoint presentation, with the exception of the Paradise Hills group, each group was asked to divide into several smaller groups to address three questions:

What are your current water conservation practices?
What are the biggest obstacles to water conservation?
How can the County promote water conservation?

The group discussions were facilitated, and notes were taken. At the end of each meeting, each group presented its comments and answers to each question. General audience questions were also addressed.

Results of Breakout Sessions

The breakout session discussions generally lasted about an hour. Group size averaged between 8-12. We have included charts that summarize the discussion and answers at the breakout sessions on the following pages.

- **Current water conservation practices:** water harvesting and rain barrels were mentioned 21 times, followed by xeriscaping and related landscaping practices mentioned 20 times, by use of low-water-use fixtures and appliances mentioned 16 times; drip irrigation mentioned 9 times; taking shorter showers etc. mentioned 7 times, and efficient well use, avoiding running water, and better water use such as watering in the morning & evening only each mentioned 5 times.

  Other conservation practices mentioned several times included water audits/fixing leaks (4), flushing toilets less often (3), taking laundry to town (3-all in East Mountains), hauling drinking/bottled water (3-all in East Mountains), sprinkler timers/moisture probes and shutting off sprinklers when raining (3).

- **Obstacles to water conservation:** mentioned most frequently were ignorance and lack of education (11) and apathy/lack of interest (9), followed by population growth and new housing (7), lack of incentives (5), and problems with gray water (5).

- Other obstacles mentioned several times included golf courses (4), the fact that water efficient appliances and systems are more expensive (4), the lack of metering of wells and 3-acre-foot-per-year limit for existing domestic wells (4), water compacts with surrounding states and New Mexico's water laws (4), no enforcement of existing regulations (3), and non-New Mexico and new developers who do not understand the state's water situation (3).

- **Promoting water conservation**: participants suggested a lot more public education (18), incentives for homeowners and young people (16), incentives for developers (5), and enforcement of existing ordinances as well as tightening of ordinances and laws for new developments (5).

  Other suggestions mentioned by several participants including making water audits and sprinkler audits available free of charge (4), encouraging low impact development and projects such as community gardens (4), providing a substantive zoning review to limit new development (3), information packets for new residents (3), and setting a good example by showing the County regards water conservation as a serious issue (3).

Areas of controversy among the groups included:

- **Whether wells should be monitored -** While a few well-owners thought this would be a good idea, many others did not believe it was needed or is warranted.

- **Whether any restrictions should be voluntary or mandatory** – Several residents stated they had moved to the County, and away from the City, to get away from government restrictions and would not welcome the imposition of mandatory water conservation restrictions.

Summaries of Individual Groups

Paradise Hills Planning Area

This meeting, which attracted the fewest participants (7), focused primarily on concerns and obstacles to water conservation. The group expressed concerns about well levels dropping and about potential loss of water rights. Some in the group seemed to feel that there was room to conserve water in all areas. Golf courses were also discussed, in terms of volume discounts, rate equity, and use of newer, more efficient technology. The group discussed cooperation between the County and private utilities, as well as partnering with conservation agencies. As in other groups, participants who get their water from private wells expressed a concern about the County monitoring their wells or changing their water allotments.

North Valley Planning Area

This meeting was a study in contrasts. It attracted 15 participants, some of whom live in newer developments within the area and some who live in older sections. Some get their water from wells, and others get their water from private utilities. The two smaller breakout groups were outspoken and contrasted widely in their perceptions and attitudes. One group was suspicious of the County's motives in arranging the public meetings, i.e., was the County "setting them up" merely to force residents who get their water from wells to put meters on those wells, or to impose more regulation? This group primarily wanted choices in water conservation. Some participants also expressed the belief that the green space and larger lots in the area make it a very desirable place to live. By contrast, the second breakout group in this meeting was much more positive and proactive. They suggested a variety of reward and educational problems such as a community garden and property tax incentives, as well as enforcing existing ordinances, developing a drought contingency plan "with teeth," and addressing each of the 43 recommendations in the regional water plan.

North Albuquerque Acres/Sandia Heights Planning Area

This meeting, which attracted 18 participants, appeared to be somewhat more knowledgeable about water conservation that participants at the previous public meetings in Paradise Hills and the North Valley. Participants were somewhat more proactive in reporting their current water conservation practices, including use of rain barrels and rain catching systems, as well as formal well share agreements and gray water systems as well as re-use of household water for non-potable purposes. They offered a wide list of obstacles to conservation, encompassing everything from a lack of incentives to ignorance, apathy and New Mexico's water compacts with other states. Both groups were positive and had a number of suggestions for effective water conservation plans, including lobbying the Public Regulation Commission to help implement conservation measures through private water utilities, incentives for builders and developers, and incentives for gray water systems. They also suggested learning

from water conservation education and outreach programs in cities such as Austin and Salt Lake City, new resident packets and rewarding businesses who conserve water.

East Mountains Planning Area

This meeting attracted the most participants by far (57). Those who attended the meeting were also the most knowledgeable and concerned about water conservation. This was evident when the majority of participants explained that they get their water from wells, that there is significant concern about running out of water in existing wells, and that there is significant concern about having enough water to support the area's continued growth. Participants were broken out into four smaller groups to discuss issues. Most of the participants in every group reported that they are already doing a number of things to conserve water. They also had the most extensive list of obstacles to water conservation, including everything from eminent domain, to lack of incentives for farmers who conserve water, to population growth and development in the area that attracts new residents who are less-water-conscious, to lack of incentives for gray water systems and rain barrels, and people who are unwilling to give up grass lawns to live in the East Mountains. New developers and golf courses were controversial among the members of several of the small breakout groups, who do not believe the East Mountains has sufficient water supply to support these activities. Among incentives discussed were lower-density housing, tiered rates for larger water users, education, discounts on a number of water conservation systems and appliances, restrictions on landscaping, tougher ordinances and enforcements of codes, and working with U.S. Forest Service to identify ways of supplying additional water to the area.

South Valley Planning Area

This meeting attracted more than 20 participants, who ranged from newcomers to longtime area residents. Some participants got their water from wells and some used ditch irrigation. Financial obstacles to conserving water were mentioned most frequently among the participants of this meeting in the two small breakout groups. Participants reported some current water conservation measures, including water harvesting, low-flow fixtures and appliances and gray water. They shared the concerns issued in the East Mountain Planning Area about higher-density housing and agreed that lot sizes should be larger. Both of the breakout groups at this meeting wanted much more education including how-to water conservation issues and even how to read meters, or understand the value of water. Preserving farmland was an issue in this group. The use of financial incentives such as free rain barrels was also viewed positively. This group had the most questions of any group, extending the public meeting for a full hour after the breakout session reports were completed.

Conclusion

The groups definitely had some things in common as well as some differences. Every group brought up xeriscaping as either a current water conservation practice or a possible County program. The most knowledgeable group, overall, were the participants in the East Mountains, followed by the participants in the North Albuquerque Acres. The group that was most concerned about agriculture, as well as the group that seemed to want information the most, were the participants in the South Valley. The group that provided the sharpest contrasts was the group of participants in the North Valley.

Overall, participants were generally in favor of ideas such as incentives (perhaps a break on property taxes since the County does not operate a water utility), rebates, and working with private water utilities to put rebates and incentive pricing in place. Of particular interest were rebates and incentives relating to lower costs for lower water use, discounts or free rain barrels, and incentives, discounts and less regulation relating to the installation of gray water systems.
It was also clear that many individuals wanted more information on water conservation, including "tips," how-to workshops, easily accessible information via the county's website and regular information on how to know how much water they are using and how to save water.

Notes on the responses of each breakout group are included in *Attachment B.*

Charts of Breakout Session Responses

The charts below and on the next few pages summarize the number of times an "answer" was given by a smaller breakout group. It is important to note that the answer totals are by group only and may have been expressed by more than participant in the group.

SUMMARY OF SMALL BREAKOUT GROUP RESPONSES TO QUESTIONS												
What are your current water conservation practices?												
Answers	PH #1	NV #2	NV #3	AA #4	AA #5	EM #6	EM #7	EM #8	EM #9	SV #10	SV #11	TOTALS
Water harvesting/Rain barrels	-	1	1	2	1	4	2	3	4	2	1	21
Xeriscaping/eliminate high water use plants/limit lawn & landscaping/use limited turf or fake turf	-	5	1	2	2	1	4	2	2	1		20
Low water use fixtures/, appliances, toilets/retrofit older homes with water-conserving fixtures	-	4	1	1	1	3	2	2	1	1		16
Drip irrigation	-	2				1	2	1	1	1	1	9
Take shorter showers/shower with a friend, take showers rather than baths			1		2		1	1	1		1	7
Avoid running water	-		1	1		1	1		1			5
Well use (efficient water management)	-	1	1	1		1	1					5
Water in the morning & evening only/better use	-	1	1		1					1	1	5
Water audit/ checking for home leaks	-		1	1		2						4
Re-using household water	-			1	1					1		3
Flush less often	-					1			1		1	3
Take laundry to town	-						2		1			3
Haul drinking water/bottled water						1	2					3
Sprinkler timers/moisture probes/shut off sprinklers when raining				2						1		3
Plant to eliminate erosion	-					1			1			2
Mulch rather than water use	-					1				1		2
Monitor swimming pool use/covers	-		1	1								2

Full washing machine loads/ Use appropriate amount of water for load size	-				1					1		2
Use concrete ditch/land/keep ditches clean											2	2
Composting toilets	-				1							1
Aerators on spigots	-				1							1
Replace swamp coolers with AC	-				1							1
Garden in pots	-					1						1
Use dishwasher less	-		1									1
New neighbors very concerned	-					1						1
Gated pipe	-										1	1

SUMMARY OF SMALL BREAKOUT GROUP RESPONSES TO QUESTIONS

What are the biggest obstacles to water conservation?

Answers	PH #1	NV #2	NV #3	AA #4	AA #5	EM #6	EM #7	EM #8	EM #9	SV #10	SV #11	TOTALS
Ignorance/Lack of education			1		2	1	1	1	1	3	1	11
Lack of interest/apathy		1	1	1	2	1			1	2		9
Population growth/new housing concerns	1	2					1		2		1	7
Lack of incentives				1	2	1				1		5
Problems with logistics of gray water/low flow systems/education/cost of using gray water/ liability issues/lack of tax shelters			2		1				1	1		5
Golf courses	1			1			2					4
"Water efficient" appliances/systems are more expensive					1			1	1		1	4
Wells are not metered/3 acre feet limit (domestic wells) too high			1	1		1	1					4
Compacts with Texas and other surrounding states/New Mexico's water laws	1			1	1		1					4
No enforcement	1			1					1			3
Non-New Mexican developers (don't understand) /new developers don't care				1				1			1	3
Swimming pools and ponds				1			1					2
Desire for aesthetic beauty of green			1					1				2
Don't want to be told what to do	1			1								2
Commercial development							1		1			2
Lot sizes									2			2
City's poor example/Poor commercial water users	1	1										2
The need for better methods for farm irrigation/cut off irrigation too early	1	1										2
What happens when agricultural land goes out of production?		2										2

Ditch systems being taken out												
Concern that xeriscaping/conservation methods may lower property value/lawns			1	1								2
Measurement of current water use/lack of actual data or how to reference it								1			1	2
Cooperation with private utilities	1											1
Jurisdictional issues: what role does the County have?	1											1
Approval sequence	1											1
People using good water to irrigate		1										1
North Valley has cooler temperatures because of the green space – if we eliminate the green space, it will get hotter		1										1
Swamp coolers		1										1
Where does recharge from the septic go?		1										1
Plumbing problems in the North Valley			1									1
Lack of social pressure			1									1
Renters' influence on property they rent			1									1
Lack of municipal support in multi-residential areas			1									1
More control on use/permits for new wells			1									1

SUMMARY OF SMALL BREAKOUT GROUP RESPONSES TO QUESTIONS

What are the biggest obstacles to water conservation? (continued)

Answers	PH #1	NV #2	NV #3	AA #4	AA #5	EM #6	EM #7	EM #8	EM #9	SV #10	SV #11	TOTALS
Neighborhood covenants that require homeowners to have lawns			1									1
Evaporation				1								1
Well-owners see water as "free"				1								1
Lack of state engineer funding				1								1
Lack of standard well share agreements				1								1
Lack of education to newcomers				1								1
Ice machines at convenience stores can be wasteful					1							1
We base way of living on standards from non-arid regions						1						1
Farmers penalized whey they save water						1						1
1,600 signatures opposing development – but passed anyway							1					1
KOA							1					1
Need or lifeline block								1				1
Cost of water (drought restrictions)								1				1

Having to go to the Laundromat								1				1
Money influences									1			1
Lake Myth										1		1
Army Corp of Engineers/MRGCD											1	1

SUMMARY OF SMALL BREAKOUT GROUP RESPONSES TO QUESTIONS												
How can the County promote water conservation?												
Answers	PH #1	NV #2	NV #3	AA #4	AA #5	EM #6	EM #7	EM #8	EM #9	SV #10	SV #11	TOTALS
More education; address small issues (watering times, washing full loads in the dishwasher, leaks in sinks, brushing teeth without running water, don't let the water run); make website and other resources available		1	3	1	3	1	2	2	1	1	3	18
Incentives for home owners and/or youth		4	2	2	1	1	2	1	2		1	16
Incentives for developers (aka incentives to put in a gray water system) and/or businesses		1		1	1	2						5
Enforce ordinances/tighten subdivision laws; Limit high density (Westgate area); New development should have a higher standard			1	1		1				1	1	5
Make water audits/sprinkler audits available					2			1		1		4
Low impact design/encourage projects like community gardens		1	1			1					1	4
Provide substantive review of zoning to limit development							1	1			1	3

SUMMARY OF SMALL BREAKOUT GROUP RESPONSES TO QUESTIONS												
How can the County promote water conservation? (continued)												
Answers	PH #1	NV #2	NV #3	AA #4	AA #5	EM #6	EM #7	EM #8	EM #9	SV #10	SV #11	TOTALS
New resident packets					1	1	1					3
Decide how serious the County is about water conservation and what measure they will take; Set a good example			1						2			3
Develop a drought contingency plan "with teeth" for the county			1	1								2
Water budgeting: determine how much water we have/where it's coming from; find a way for use to be in balance w/ supply			1				1					2
Model other successful cities (City of Austin and Salt Lake City outreach programs)					1				1			2
Time rates with high use							1			1		2
Eliminate outside plantings; make footprint of house equal to size of lawn						2						2
Promote green building technology for new construction/Implement water conservation standards similar to the county's current energy/building standards			1			1						2
Design systems to recapture water (old systems captured rain off the roof)		1										1
Less government control		1										1
Make programs optional		1										1
Have public and private properties use catch basins or leach fields		1										1
Start a Water Conservation Corps		1										1
Be consistent with neighboring jurisdictions			1									1
Ask the consultant to identify what the county is going to do about each of the 43 recommendations in the regional water plan			1									1
Establish a dedicated funding source for water projects			1									1
Lobby PRC to mandate water conservation Efforts (for private water utilities)				1								1
Increase ESGRT tax from 1/8 to ¼ cent				1								1
Grants for extending the utility incentive program				1								1
Monitor parks and watering				1								1
Water waste restrictions					1							1
Measure water use					1							1
Promote transition						1						1
Prevent adjacent communities from tapping into forests						1						1
Water waste restrictions					1							1
Measure water use					1							1
Promote transition						1						1
Prevent adjacent communities from tapping into forests						1						1
Historical Conservation Practices								1				1

SUMMARY OF SMALL BREAKOUT GROUP RESPONSES TO QUESTIONS												
How can the County promote water conservation? (continued)												
Answers	PH #1	NV #2	NV #3	AA #4	AA #5	EM #6	EM #7	EM #8	EM #9	SV #10	SV #11	TOTALS
Improve septic systems drainage									1			1
Determine the purpose of conservation									1			1
Buy water rights, build pipe lines									1			1
Thin trees in National Forests (particularly Cibola and the Bosque)									1			1
Make restrictions on landscaping									1			1
Shut off sprinklers when raining										1		1
Offer "how to" workshops										1		1
Provide information on "do it yourself" options										1		1
Golf courses – only water golf course greens										1		1
No swimming pools										1		1
Help understanding meters										1		1
Implement SW area – make it a law											1	1
Plan for various sector plans											1	1
Develop/protect open space											1	1
Keep the ditches clean – rather than relying on MRGCD											1	1
Be smart about change/eye to the future											1	1
Develop the mesa rather than the valley											1	1
Urban boundaries – like Europe – to preserve farmland											1	1
Give away rain barrels											1	1
Use barley straw to avoid mosquitoes											1	1
Promote program to provide retirement benefits											1	1
Store more water upstream											1	1
Questions of solvents and pesticides getting into ground water											1	1

Additional Meeting & Comments

In addition to the scheduled public meetings, on July 7th 2005 Kerry Bassore of the Bernalillo County Public Works Division gave an update on the development of the water conservation plan to the board of the Ciudad Soil and Water Conservation District. The intent of the update was to identify areas of cooperation and receive questions and input on the water conservation plan development

Questions and comment received included:

- What can be done about new developments like the 14,000 acre development being planned by Westland on the west mesa when we don't have enough water?
- Is the County going to limit the number of domestic wells being drilled?
- Is this plan just to save water so it can be used for new development?
- Agriculture should get credit for recharging the aquifer.

Also, one resident offered written suggestions on how to conserve and preserve water in addition to providing verbal suggestions. A copy of his suggestions is included in *Exhibit E.*

Values Exercise

At all meetings except the initial public meeting for the Paradise Hills Planning Area, a values exercise titled "Water in Bernalillo County" was handed out to participants. Participants were asked to rank 13 different factors in developing a water conservation plan and program for Bernalillo County in order of importance, with 1 being the most important and 13 being the least important. A sample of the survey is included in *Attachment D.*

The County received 11 surveys from the North Valley group, 16 surveys from the North Albuquerque Acres/Sandia Heights group, 40 surveys from the East Mountains group and 19 surveys from the South Valley group. A summary of results is included on the following page.

RESULTS OF VALUES SURVEYS					
Value	Avg. Ranking North Valley (n=11)	Avg. Ranking N. Abq. Acres/ Sandia Hts. (n=16)	Avg. Ranking East Mtns (n=40)	Avg. Ranking S. Valley (n=19)	Overall Avg. Ranking
Watering existing yards & landscaping	5.7	4.0	5.0	5.5	5.1
Community parks & sports fields	5.9	5.3	6.1	7.0	6.1
Indoor use in existing homes	1.7	1.4	1.8	3.6	2.1
Recreation: fishing, rafting, etc.	8.7	8.5	7.8	7.6	8.2
Irrigation for farms	3.5	6.9	4.5	3.6	4.6
Indoor use in new housing	6.0	5.9	6.4	7.4	6.4
Cultural & religious uses	5.2	9.8	6.5	6.8	7.1
New industrial uses (manufacturing)	9.6	8.6	8.6	8.9	8.9
Swimming pools for individual homes	11.1	10.7	11.1	11.1	11.0
Yards & landscaping in new developments	9.7	8.8	8.1	9.1	8.9
Providing food and refuge for animals	5.1	6.3	5.8	3.7	5.2
Watering golf courses	11.7	10.1	10.8	12.3	11.2
Preserving the Bosque	5.8	6.1	7.1	4.1	5.8

We have highlighted the lowest value • (most important) with blue and the highest value • (least important) with red in each column above. A simplified ranking based on the results above follows on the next page.

RANKING OF VALUES					
Value	Avg. Ranking North Valley (n=11)	Avg. Ranking N. Abq. Acres/ Sandia Hts. (n=16)	Avg. Ranking East Mtns (n=40)	Avg. Ranking S. Valley (n=19)	Overall Avg. Ranking
Watering existing yards & landscaping	5	2	3	5	3
Community parks & sports fields	7	3	5	7	6
Indoor use in existing homes	1	1	1	(tie) 1	1
Recreation: fishing, rafting, etc.	9	8	9	9	9
Irrigation for farms	2	7	2	(tie) 1	2
Indoor use in new housing	8	4	6	8	7
Cultural & religious uses	4	11	7	6	8
New industrial uses (manufacturing)	10	9	11	10	(tie) 11
Swimming pools for individual homes	12	13	13	12	12
Yards & landscaping in new developments	11	10	10	11	(tie) 11
Providing food and refuge for animals	3	6	4	3	4
Watering golf courses	13	12	12	13	13
Preserving the Bosque	6	5	8	4	5

- Of most importance in all four groups was the **use of water for existing homes**, except for the South Valley group, where there was a tie between use of water for existing homes with irrigation for farms.

- The next value deemed most important was split between **irrigation for farms** (two groups) and **watering existing yards and landscaping (**one group).

- The groups were split on which value is least important. Two groups cited **watering golf courses** and two groups ranked **swimming pools for individual homes** as least important.

- The groups **did not agree on the ranking of other factors**, as shown by the charts on the previous page.

- The group with the **most variance** in average ranking of factors was the **North Valley**. The group with the least variance in ranking of factors was the **South Valley**. In other words, the largest span between the average ranking for the most important factor and the least important factor, was expressed in the North Valley (10.1) and the smallest span was expressed in the South Valley (8.7). This indicates there was wider divergence of viewpoints in the North Valley than any other group, and more agreement in the South Valley than in any other group.

Overall, un-weighted average rankings from most important to least important are:

1 Indoor use in existing homes
2 Irrigation for farms
3 Watering existing yards and landscaping
4 Providing food and refuge for animals, birds and other wildlife
5 Preserving the Bosque
6 Watering community parks and sports fields
7 Indoor use in new housing developments
8 Cultural and religious uses
9 Recreation: fishing, rafting, etc.
10/11 Tie - New industrial uses (manufacturing)/yards & landscaping in new developments
12 Swimming pools for individual homes
13 Watering golf courses

Comparison with June 2000 Survey on "Attitudes and Preferences of Residents of the Middle Rio Grande Water Planning Region Regarding Water Issues

This survey, which was completed more than five years ago, questioned 589 respondents living in the Middle Rio Grande Region about their initial views on water and the environment, knowledge and perception about water issues, values in relation to water, and water policy preferences. While the sample size was much larger than simply residents who live in the unincorporated areas of Bernalillo County, there is undoubtedly some overlap.

Overall Knowledge of Water Conservation

There was a clear difference in perceptions about water conservation as it relates to our underground aquifer expressed in the 2000 survey versus the perceptions expressed in the 2005 Bernalillo County Water Conservation Public Meetings.

When asked the question, "If we keep pumping water from the underground at the rate we're doing it now, we will deprive our children and grandchildren of the quality of life we've had," in 2002, only about 70 percent of the Middle Rio Grande respondents agreed. According to the report's executive summary, there were significant neutral responses and "don't knows/not applicables" which suggested considerable uncertainty about this issue. Yet at the 2005 meetings, only a very few participants questioned the need for water conservation, and a number seemed to know that we were seeking alternative sources of water through the San Juan-Chama Drinking Water Project in order to allow the underground aquifer to recharge. This may have been due to the City of Albuquerque's ongoing water conservation programs and to education and public involvement surrounding the planning, and now the construction, of the drinking water project. Overall, participants in the 2005 public meetings seemed to agree that water conservation is important.

Values Comparison

In Section 3 of the 2000 survey, respondents were asked to make implicit choices among competing demands for a limited supply of water by rating the importance of various uses. Uses they were asked about included:

#72 – Irrigation for farms
#73 – Watering golf courses
#74 – Recreation, such as fishing and rafting
#75 – New industrial uses, such as manufacturing processes
#76 – Indoor use in existing homes
#77 – Watering existing yards and landscaping.
#78 – Indoor use in new housing developments
#79 – Use for yards and landscaping in new developments
#80 – Swimming pools for existing homes
#81 – Community parks and sports fields
#82 – Proving food and refuge for fish, birds and other animals
#83 – Cultural and religious uses in some villages and pueblos
#84 – Preserving the native cottonwood forest and vegetation along river banks known as the Bosque that creates habitat for a variety of different animal species

The 2000 survey ranked importance with a higher number rather than a lower number, which was used at the Bernalillo County public meetings.

A chart summarizes the rankings of each factor below, based on response to the survey from the Middle Rio Grande Residents. We have converted the 2000 survey rankings to a low number = high importance scale for comparison purposes.

Comparison of Values Surveys Rankings		
Value	2000 Attitude/Preference Survey Ranking	2005 Bernalillo County Ranking from Public Involvement Meetings
Watering existing yards & landscaping	10	3
Community parks & sports fields	8	6
Indoor use in existing homes	1	1
Recreation: fishing, rafting, etc.	7	9
Irrigation for farms	3	2
Indoor use in new housing developments	5	7
Cultural & religious uses	6	8
New industrial uses (manufacturing)	9	(tie) 11
Swimming pools for individual homes	13	12
Yards & landscaping in new developments	11	(tie) 11
Providing food and refuge for animals	4	4
Watering golf courses	12	13
Preserving the Bosque	2	5

Environment

Respondents to the 2000 survey expressed a fairly strong agreement with the statement, “Keeping water in rivers to provide a green corridor and protect habitat for wildlife and vegetation is important.” While the Bernalillo County participants also felt fairly strongly about protecting the Bosque (#5 in importance on rankings) and providing

food and refuge for animals (#4 on values), these topics were of less importance than having enough water for use in existing homes and to irrigate farms.

Water Management

There was less discussion in the Bernalillo County groups about coming to an agreement on a plan for managing water to avoid conflict than agreement with a question along those lines in the 2000 survey. However, several different people in groups alluded to the water compacts, competing interests from other states, and the issue of eminent domain.

Aquifer

In the 2000 survey, there was some understanding that we need to stop pumping water from our underground aquifers and allow them to recharge if we want to have water for future generations. There was much ore understanding of this issue at the 2005 meetings, undoubtedly due to the fact that the San Juan-Chama Drinking Water Project is now underway. A number of questions about this project were asked at the meetings.

Both the 2000 survey respondents and the 2005 groups were generally supportive of agriculture, although the North Albuquerque Acres/Sandia Heights group in the Bernalillo County planning process ranked agriculture as somewhat less important.

Priority Concerns

Water quality was the number one concern/priority expressed in the 2000 survey, but was not prioritized in the 2005 groups due to the focus on conservation. Some questions were asked about water quality in wells and in groundwater, but having enough water was more of a concern in 2005.

The 2000 survey group ranked having enough water to maintain residential lawns and gardens as last in importance of seven potential water issues. The 2005 Bernalillo County group ranked the same issue as third in overall importance, although the North Valley and South Valley groups did not believe it was as important. Xeriscaping, installing efficient sprinklers, watering only at night or in the early morning, etc. were considered important water conservation measures that many of the 2005 participants are already enacting.

New Development

In terms of new development, more than half of 2000 survey respondents agreed strongly that new housing or business developments should depend on demonstrating a long-term water supply is available. This sentiment was echoed in the 2005 Bernalillo County meetings, with participants ranking new housing developments low on the priority list unless these conditions can be met, and with several groups advocating low-density housing in new developments...

Drought

The issue of a long-term drought was more pronounced in the 2000 survey than in the 2005 Bernalillo County water conservation meetings, probably because this region experienced a very wet winter/spring in 2005 compared to normal rainfall. However,

participants recognize that a drought can come again, at any time, and a number want the County to have a plan in place for water use during drought conditions.

Reuse of Water

Reuse of household water was definitely most pronounced in the 2005 East Mountain meeting. In the 2000 survey, a majority of respondents said they would reuse water from bathing, laundry or washing dishes for outdoor use.

Many of the 2005 Bernalillo County participants stated they would like to use gray water systems, but face a number of obstacles including cost with no incentives, regulations, etc.

Voluntary versus Mandatory Conservation

The issue of voluntary versus mandatory water conservation practices was somewhat controversial in the 2005 Bernalillo County meetings. Many residents pointed out that they are "independent," and that they moved to the County to get away from the restrictions imposed by the City of Albuquerque. In the 2000 survey, more than half of respondents advocated voluntary measures, time-of-day watering restrictions, and a tiered rate system during drought conditions, although less than half advocating raising the price of water for all households and businesses.

The 2005 participants did advocate a tiered water rate system that would charge large users more. They also pointed out that farmers are penalized for saving water.

Native American Water Rights

The 2000 survey asked a specific question about this issue, with about one-fifth of respondents agreeing that the issue of Native American water rights should be put before other water rights. This issue did come up for discussion at a couple of the 2005 Bernalillo County meetings, with some participants wondering about the validity of new golf courses on Native American lands.

Again, while the 2000 "Attitudes and Perception" survey was quantitative and the five Bernalillo County water conservation meetings were qualitative, we did find some areas of common concern, as well as some areas of disagreement. We do not think they are directly comparable, particularly since the sample of Middle Rio Grande residents included those living within City boundaries and in other areas, as well as unincorporated portions of Bernalillo County.

Comparison with June 2002 Survey on "Perceptions of Water Quality and Supply in the Unincorporated Areas of Bernalillo County"

This survey of 5,000 households in the unincorporated areas of Bernalillo County focused on perceptions of water quality, supply, delivery and public policy related to water. The most comparable area of this study and the 2005 Bernalillo County public information meetings was supply. Slightly more than half of the respondents in the survey worried about the long-term supply of water to the households in their neighborhood, predating sentiments expressed in the 2005 public meetings. The

overwhelming majority of respondents in this survey supported water policies relating to protecting the water supply and ensuring water quality, and this type of activity was suggested in virtually all of the public meetings when smaller breakout groups were asked, “How can the County promote water conservation?”

Like the public meetings, the 2002 survey broke respondents down into different areas, although there were four groups in 2005 and five groups in 2005:

2002 Survey	**2005 Public Meetings**
East Mountains	East Mountains
Sandia Foothills (including N. Albuquerque Acres)	North Albuquerque Acres/Sandia Heights
North Valley	North Valley
South Valley	South Valley
	Paradise Hills

In the 2002 survey, the areas most concerned about future water supply were the South Valley, the East Mountains, and the North Valley. Sandia Foothills residents (which included North Albuquerque Acres) were least concerned. In the 2005 public meetings, East Mountain residents were most concerned about water supply based on comments and discussion, followed by South Valley, North Valley, and Paradise Hills. In both the 2002 survey and the 2005 public meetings, the area least concerned about water supply seemed to be North Albuquerque Acres/Sandia Foothills or Sandia Heights.

In the 2002 survey, private individual well respondents were worried about the long-term supply of water, although they have water whenever needed. There was also concern about water expressed among those participants who attended the 2005 meetings and who get their water from private wells. The highest rate of worry about long-term supply in 2002 was expressed among well-share respondents. Since we do not know how many well-share respondents attended the 2005 meeting, we cannot compare the rate of worry about types of water customers.

Among the 2002 survey participants, those on community water systems had the highest rate of agreement that their homes would have water whenever they need it. Anecdotally, this was also true among those who attended the 2005 public meetings.

In the 2005 survey, 87.6 percent of respondents agreed that the County should provide education to the general public about protecting the water supply. In 2005, virtually every small breakout group at the public information meetings also suggested that the County should provide education on water conservation.

Comparison with May 2005 Survey on “East Mountain Area Water Survey”

This survey, which was completed as a class project for a graduate studies program in Community and regional planning, involved surveying 111 East Mountain Area residents on whether they believe there is a water shortage in the East Mountain Area and, if so, what they are willing to do about that shortage.

The survey was conducted by class members at various locations in the East Mountains and was publicized in the *Mountain View Telegraph* and *The Independent*, two local papers.

The five essential questions the team sought answers to were:

1. Is there a concern about water supply decreasing?
2. What conservation measures are residents taking?
3. Is there a willingness to participate in water conservation activities?
4. Are EMA residents willing to have their water use regulated?
5. Are there correlations between the first four questions and EMA demographics?

Since this survey focused on the East Mountain area only, its results will be compared with results from the Bernalillo County East Mountain public information meeting only.

In the 2005 survey, 72.5 percent of respondents felt there is not enough water to support the increasing population in the East Mountain area. This sentiment was echoed in the June 2005 public information meeting among participants and in the small breakout groups.

In the 2005 survey, 79.8 percent of respondents were concerned about their water supply decreasing. This sentiment was also expressed in the June 2005 public information meeting among participants and in the small breakout groups.

In the 2005 survey, a total of 93.1 percent of respondents reported participating in 1-9 water conservation activities. This level of participation was supported, on an anecdotal basis, among participants in the June 2005 public information meeting when they were asked, in small breakout groups, “What are your current water conservation practices?:”

The 2005 survey asked a question about willingness to have water use regulated. Of those surveyed, nearly half (43.4 percent) supported legislation to limit domestic well permits and more than a third (39.6 percent) supported a restriction to limit summertime outdoor water use hours. More than a third (38.5) would be willing to have a water meter installed. While none of these recommendations were “measured” at the East Mountain public information meeting in June 2005, similar sentiments were expressed by one or more of the smaller breakout groups.

The 2005 survey found that respondents who have lived in the East Mountain Area for five years or less are much more likely to be willing to participate in water-conservation activities than are longer-term residents. This finding was not necessarily confirmed by participants at the East Mountain public information group. Many of the participants who reported the highest level of current water conservation activities were long-term (five years plus) residents.

The 2005 survey found that while most respondents are concerned about the water issue, those connected to a community well responded ambivalently to the issue of water supply. This was supported by the participants who attended the 2005 public

information meetings and who got their water from private wells expressed the most concern about water supply, followed by those on well shares or community wells.

While the sample size of the 2005 survey was small and the 2005 public information meeting was qualitative instead of quantitative in terms of data gathering, the results from these activities largely support each others' findings.

Attachment A – List of Public Information Meeting Participants

Attendance at Bernalillo County Water Conservation Public Meetings	
Paradise Hills	
Lisa Lee	Adam & Vickie Cuevas
Steve Glass	Alex Newman
Larry Weaver	Nancy Sawyer
North Valley	
Keith M Creveling	Ron Tamura
Charles Mann	Martin Zehr
Mary Salazar/Commissioner Alan Armijo	David Plagge
Jeff Potter	Sandi Hammerstran
Jim Brinkman	Elvidio Druiz
John Rael	Bob Wessely
Richard Becker, PhD	
North Albuquerque Acres/Sandia Heights	
Bob Wessely	JR Gherich
Don Crismore	J. Logtheter
Matt Cross Guillen	Andre Claudet
Gioegia Ramey	Evson Noftsker
Shirley Godfrey	Bill & Kay Johnson
Elvidez V. Diniz	Allen Briggs
Frank Roth	Susan Fakhvaj
Debbie Stover	Andrew Funk
N. Mace	Richard Daerz
Rob & Celeste Loughridge	Nancy Galloway
East Mountains	
Myrtle L. Brown	Val Barlay
Fred Brown	Christius Shuth
Navar Frain	Maria Padilla
John L. Jures	Jolanda Garcia
Linda Barbour	Terese Mares
Carl White	Erlinda Henna
Jason Hadew	Kelli Livermore
Sandra Lee	Tom Moore
Cleveland Wells	Jim Tolle
Robert Thompson	Mollie Miller
Estevan Garcia	Kathy McCoy
Robert Blankert	John Hickerson
Rachel Newsuist	Richard Hicks
Carl D. Houghaur	Anselmo Herrbaca
Ed Burrough	Bob Wessely
Dan Palung	Stacey Boyne
Jay Bronber	Laura Head
Michael Bronber	Sue Johnson
Jim Zobilole	Kevin Bean
Jim Calahan	Ralph Powell
AS DeQuin	Susan Clair
Adeline Herrera	David Holcomb
Ramone CH Ritz	Joe Chavez
Walter McDonough	Dana Schubert
Dan	Pepe Brown
Jay Broadhead	Rita Loy Simmons
Jeffrey Zirzow	Marge patton

Attendance at Bernalillo County Water Conservation Public Meetings	
East Mountains (continued)	
Judy Vredenburg	Max Lowry
Jeremy Brown	Commissioner Michael Brasher
South Valley	
Rexne Nefe	Frank Gallegos
Bruce Nefe	Bob McGoldrick
Jason Hansen	Gail Stockton
Juan Serrano	Catherine McGwen
John Adams	Bob Wessely
Sara Newton Juarez	Marilyn Bauer
Jack L. Montley	Zoe Ecomomoy
Medora Gaines	Clark Pino
Beatrice Saeidez	Katherine Walter
Angela Luster	John Patterson
Suzanne Seymour	

Water Meeting Attendees 2006	
Paradise Hills 1/19/2006	
Alex Newman	Duane Burgeson
Daniel and June Dember	
North Valley 2/9/2006	
Amy Ewing	Karen Plat
Bob Wessely	Katya Miller
C. Elaird	Larry Steel
Callie Gibson	M Woodard
Charlie Gates	Maceo Martinet
Dale Amend	Mary A Salazar for Comm. Armijo
Dane Hannum	Peter Driscoll
David Plagger	Phil Montoya
Debbie Browne and Ricardo Zunga	Ray Gutierrez
Debbie Steele	Richard Abruzzo
Dennis and Lisa McCary	Robert Whgel
Don and Ann Isbell	Ron Novak
Donald Veen	Ron Tamura
Doris Vician	Sam Eldridge
E.A. "Swede" and Althea Scholer	Sandi Hommerstrum
Gary Lucero	Sharon Harrington
Hary Hunsaker	Suzanne Rice
Howard Cruner	Sylvia Hauser
Janice Caudill	Vee Amador
Jim Plagens	Waldo Sanchez
John Sparks	Yolanda Gomez
North Albuquerque Acres/Sandia Heights 1/26/2006	
Andew Funk	Fred Olivas
Andie Warford	James Tomecsek
Andre Claudet	Jim and Linda Rotegé
Barb and John Scott	Larry Shore
Bill and Kay Johnson	Laura Criel
Bruce Criel	Nicholas Mace
Carmen Lopez and Priscilla Rael	Penny Darsey
Cindy Murray	Priscilla Ramke
Coral Rogers	Ray Rogers
Elvideo Diniz	Samantha Updegraff
Eric Henry	Scott Clark
Eric Nuttall	Suzette Brooks
East Mountains 2/1/2006	
Adeline Herrera	John Peterson
B. Amber Keenan	Joseph Quintana
Bob and Sheila Bickes	Kelli Livermore
C. Max and Jody Lowry	Leslie Haven
Carl White	Linda Barbour
Daniel Gutierrez, Sr	Macurio Griego
David W. Miller	Manual Garcia
Dusham Mitrovich	Margaret M. Carroll
Ed Burroughs	Marge Patton
Ed Rhodes	Mary Julyan
Eloy P Jaramillo	Mel Gellenthien
Frank Apodaca	Melta Raven Heart
East Mountains 2/1/2006 (continued)	

Fred and Julie Gray	Morgan Kramm
Fred and Myrtle Brown	R/S Rymarz
Gary Bender	Richard Hieke
Guelfi Aido	Rob Easterling
Jake Garcia	Robert Thompson
James G Jensen	Sarah Falk
James Nim	Simon Hancock
Jane Davidson	Steve Hieke
Jay and Carol Mayer	T Salazar
Jim Medford	Thomas M Shouther
John Brennan	Tomas and Christine Apodaca
John Hickerson	Vern Hershberger
South Valley 2/16/2006	
Jeanne Howard	Guadalupe Garcia
Marcia Fernandez	Juan Serrano
Rip Anderson	P Montoya
Sara Newton Juarez	Daniel Bracken
Irene and Albert Chavez	Susan White
Jerry W Donalson	Priscilla Ramke
Joan M Donalson	John Shipley
Mary Tyler	Herbert Harling
Orlina Page	Johnnye Lewis
Magdalena C. Delgado	Amanda Warzeniak
Vince Gomez	Karin Fulford
Henry Snachez	Jerry Rodriguez
Rose Sanchez	James Raley
Robert Kyze	Joseph Miller
Deborah L Hall	Kathleen Miller
Joe Guaaulo	Jack L Mortley
Kathy Gonzales	Louie Gurule
Leo Mendoza	Michael M. Selph
Ermenio and Marie Salas	Pat McCraw
Eloy Moya	Carmel R. Vigil Jr
Mary Jobe	Larry McKinney
Ronald Jobe	Louise Shank
Ray Aranda	J.O. Luna
David A Vargas	Leslie A Fincher
Norma J. Vargas	James A Woodward
Henry Meyers	Michael J Gadler
Mr. and Mrs. Joe Sais	Teresa Cordova
Fred Gonzales	
190 Total Participants	

Attachment B – Customized PowerPoint Presentations

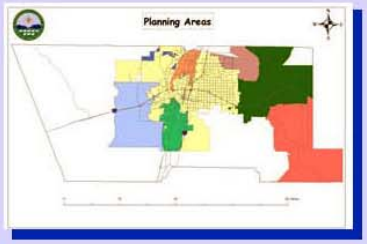
PRESENTATIONS – FIRST MEETINGS

Paradise Hills – 1

Water in Bernalillo County

Developing a Water Conservation Plan and Program

Bernalillo County Water Conservation



Bernalillo County Water Conservation

Bernalillo County Water Conservation

Why Develop a Plan?

- Water is a Limited Resource
  - Aquifer Drawdown – 160' in 30 Years, Some Areas
  - Long-term Supply – Quality & Quantity Issues

Bernalillo County Water Conservation

- Reliable water supply for future generations
- State funding tied to water conservation plans
- Increases in one type of water use generally takes water from another use

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Bernalillo County Water Conservation

Water Sources	Population Served
Albuquerque Bernalillo County Water Utility	86%
Domestic Wells	8%
Private Utilities	5%
Well Shares	1%

US Census estimate for Bernalillo County population in 2004 is 594,000; 86% would be 510,000

Paradise Hills – 2

Bernalillo County Water Conservation

Population	Residential Water Use	Ave HH Size	Ave HH Water Use Per Day
Albuq – 510,000	126 gpcd	2.4	303 gphd
El Paso – 663,000	114 gpcd	3.1	353 gphd
Phoenix – 1,321,000	165 gpcd	2.8	462 gphd
Tucson – 488,000	120 gpcd	2.4	288 gphd
NM Utilities – 45,000	93 gpcd	3.2	297 gphd

Bernalillo County Water Conservation

What Affects Residential Use?

- Availability
- Development Patterns
  - Age of Development
  - Lot Size
  - Landscape Type
- Household Size
- Cost of Water
- Unaccounted-for Water (UAW)

Bernalillo County Water Conservation

Current Conservation Practices

- Albuquerque Bernalillo County Water Utility Authority (ABCWUA)
- New Mexico Utility
- Business and Commercial
- Private Individuals

Bernalillo County Water Conservation

Values List (2000 BBER Survey)

High Rank

- Indoor Use in Existing Homes
- Preserving the Bosque
- Irrigation for Farms
- Providing Food and Refuge for Fish, Birds and Other Animals

Bernalillo County Water Conservation

Values List

Medium Rank

- Indoor Use in New Housing Developments
- Cultural and Religious Uses in Some Villages and Pueblos
- Recreation, such as Fishing and Rafting
- Community Parks and Sports Fields
- New Industrial Uses, such as Manufacturing Processes

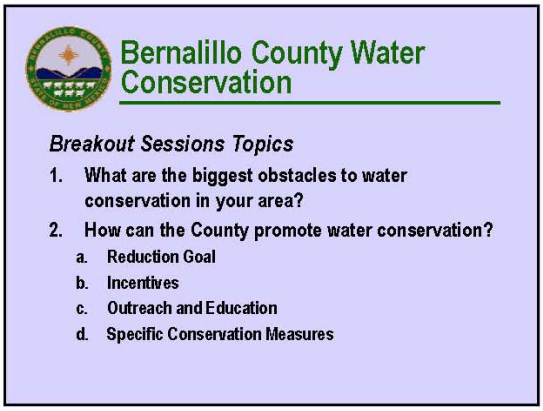
Bernalillo County Water Conservation

Values List

Low Rank

- Watering Existing Yards and Landscaping
- Use for Yards and Landscaping in New Developments
- Watering Golf Courses
- Swimming Pools for Individual Homes

Paradise Hills – 3

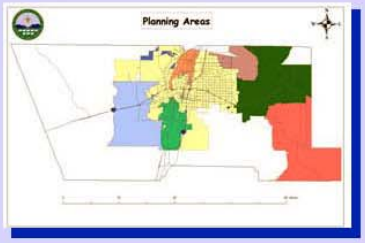


North Valley – 1

Water in Bernalillo County

Developing a Water Conservation Plan and Program

Bernalillo County Water Conservation



Bernalillo County Water Conservation

Bernalillo County Water Conservation

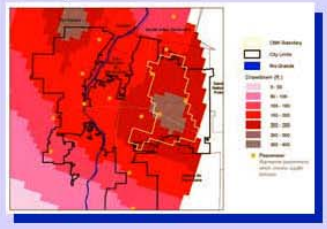
Why Develop a Plan?

- Water is a Limited Resource
  - Aquifer Drawdown – 160' in 30 Years, Some Areas
  - Long-term Supply – Quality & Quantity Issues

Bernalillo County Water Conservation

Drawdown in Albuquerque Basin Aquifer

Pre-development to 2060 — No Action



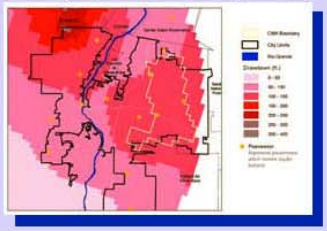
Taken from "A Sustainable Water Supply for The Albuquerque Metropolitan Area, 2005"

Sources: CH2M Hill, USGS Bexfield/Anderholm Report, 2002

Bernalillo County Water Conservation

Drawdown in Albuquerque Basin Aquifer

Pre-development to 2060 — With Drinking Water Project



Taken from "A Sustainable Water Supply for The Albuquerque Metropolitan Area, 2005"

Sources: CH2M Hill, USGS Bexfield/Anderholm Report, 2002

North Valley – 2

Bernalillo County Water Conservation

- Reliable water supply for future generations
- State funding tied to water conservation plans
- Increases in one type of water use generally takes water from another use

Bernalillo County Water Conservation

Water Sources	Population Served
Albuquerque Bernalillo County Water Utility	35-40%
Domestic Wells	45-50%
Public/Private Utilities	15-20%
Well Shares	1% or less

US Census estimate for Bernalillo County, unincorporated area population in 2000 is 106,000

Bernalillo County Water Conservation

Entities with Jurisdiction in the North Valley

- Bernalillo County
- City of Albuquerque
- Village of Los Ranchos
- Office of the State Engineer
- Albuquerque Bernalillo County Water Utility Authority
- Middle Rio Grande Conservancy District
- Public Regulatory Commission
- Soil and Water Conservation Districts

Bernalillo County Water Conservation

What Affects Residential Use?

- Availability
- Development Patterns
  - Age of Development
  - Lot Size
  - Landscape Type
- Household Size
- Cost of Water
- Weather
- Individual Practices

Bernalillo County Water Conservation

Population	Residential Water Use	Ave HH Size	Ave HH Water Use Per Day
Albuq – 510,000	126 gpcd (calculated)	2.4	303 gphd
El Paso – 563,000	114 gpcd	3.1	353 gphd
Phoenix – 1,321,000	165 gpcd	2.8	462 gphd
Tucson – 488,000	120 gpcd	2.4	288 gphd
Rio Rancho – 60,000	116 gpcd	2.7	310 gphd
Santa Fe – 66,000	111 gpcd	2.2	244 gphd

Bernalillo County Water Conservation

Demographic Data from Census 2000

North Valley Population	19,490
Number of Households (HH)	7,720
Average HH Size	2.52
Single Family Units	7,330
Multi-Family Units	970

These numbers are preliminary estimates

North Valley – 3

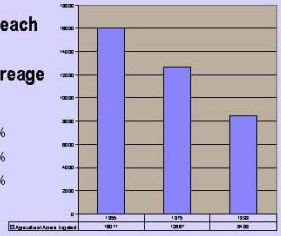
Bernalillo County Water Conservation

Water Supply in the North Valley	No. of Connections
Albuquerque Bernalillo County Water Utility Authority Utility Customers	6,250
Albuquerque Bernalillo County Water Utility Authority Water Only Customers	2,339
Middle Rio Grande Conservancy District Irrigation Ratepayers	Pending
Domestic Well Permits	Pending
Community Water Systems: Mobile Home Parks (Population 639)	5

Bernalillo County Water Conservation

Albuquerque Reach Change in Agricultural Acreage

% Decrease	
1955 – 1975	21%
1975 – 1993	33%
1955 – 1993	47%



Bernalillo County Water Conservation

Breakout Sessions Topics

What are your current water conservation practices?

What are the biggest obstacles to water conservation?

How can the County promote water conservation?

a. Reduction Goal
b. Incentives
c. Outreach and Education
d. Specific Conservation Measures

Bernalillo County Water Conservation

For more information or to provide additional suggestions:

Kerry Bassore, Bernalillo County Public Works
(505) 848-1552
kbassore@bernco.gov

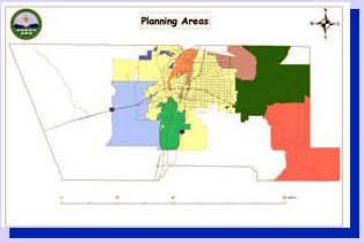
THANK YOU!

North Abq. Acres/Sandia Hts. – 1

Water in Bernalillo County

Developing a Water Conservation Plan and Program

Bernalillo County Water Conservation



Bernalillo County Water Conservation

Bernalillo County Water Conservation

Why Develop a Plan?

- Water is a Limited Resource
  - Aquifer Drawdown – 160' in 30 Years, Some Areas
  - Long-term Supply – Quality & Quantity Issues

Bernalillo County Water Conservation

The Regional Problem —
Ongoing Deficit Spending of Water – *Past Quarter Century*

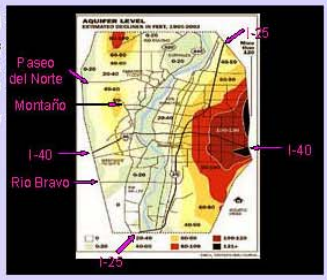
Source: Middle Rio Grande Water Planning Assembly

Bernalillo County Water Conservation

Background

Drawdown of Aquifers in the Albuquerque Area

1960 to 2000



Source: U.S. Geological Survey, 2003

North Abq. Acres/Sandia Heights – 2

Bernalillo County Water Conservation

- Reliable water supply for future generations
- State funding tied to water conservation plans
- Increases in one type of water use generally takes water from another use

Bernalillo County Water Conservation

Water Sources	Population Served (Unincorporated County)
Albuquerque Bernalillo County Water Utility	35-40%
Domestic Wells	45-50%
Public/Private Utilities	15-20%
Well Shares	1% or less

US Census estimate for area population in 2000 is 106,000

Bernalillo County Water Conservation

Entities with Jurisdiction in North Albuquerque Acres and Sandia Heights

- Bernalillo County
- Office of the State Engineer
- Public Regulatory Commission
- Soil and Water Conservation Districts
- Community Water Systems (Sandia Peak Utility Company, Tierra Monte Water Users Assoc., Ventura Estates, Oakland Heights)

Bernalillo County Water Conservation

What Affects Residential Use?

- Availability
- Development Patterns
  - Age of Development
  - Lot Size
  - Landscape Type
- Household Size
- Cost of Water
- Weather
- Individual Practices

Bernalillo County Water Conservation

Population	Residential Water Use	Ave HH Size	Ave HH Water Use Per Day
Albuq – 510,000	126 gpcd (calculated)	2.4	303 gphd
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Tucson – 488,000	120 gpcd	2.4	288 gphd
Rio Rancho - 60,000	116 gpcd	2.7	310 gphd
Santa Fe - 66,000	111 gpcd	2.2	244 gphd
No. Abq Acres/Sandia Heights — 19,000	117 gpcd	3.1	363 gphd

Bernalillo County Water Conservation

Demographic Data from Census 2000

No. Abq Acres/ Sandia Heights Population	15,960
Number of Households (HH)	5,124
Average HH Size	3.1
Single Family Units	4,452
Multi-Family Units	672

Estimates prepared by Smart Use, LLC from multiple sources

North Abq. Acres/Sandia Heights – 3

Bernalillo County Water Conservation

Water Supply in N. Abq Acres & Sandia Hts	No. of Connections/Popul
Albuquerque Bernalillo County Water Utility Authority Utility Customers	0
Domestic Well Permits	Pending
Well Shares	Pending
Community Water Systems	
Sandia Peak Utility Co.	2,373
Tierra Monte Water Users Assoc.	63
Ventura Estates	100
Oakland Heights	29

Bernalillo County Water Conservation

Sandia Peak Utility Company

At 95% of capacity — 2,500 connections

Current Connections	**2,373**	
Residential	2,344	(99%)
Commercial/Bulk Customers	29	(1%)

Year Pumped

2002 361,632,000
2003 368,975,000
2004 366,012,000

Residents pay set rate unless they use more than 9,000 gallons in one billing period

Bernalillo County Water Conservation

Bernalillo County Water Conservation

Bernalillo County Water Conservation

Bernalillo County Water Conservation

Breakout Sessions Topics

What are your current water conservation practices?

What are the biggest obstacles to water conservation?

How can the County promote water conservation?

a. **Reduction Goal**
b. **Incentives**
c. **Outreach and Education**
d. **Specific Conservation Measures**

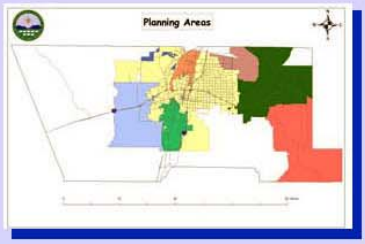
North Abq. Acres – Sandia Hts. – 4

East Mountains – 1

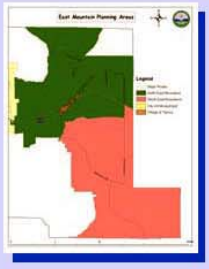
Water in Bernalillo County

Developing a Water Conservation Plan and Program

Bernalillo County Water Conservation



Bernalillo County Water Conservation

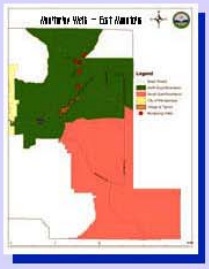


Bernalillo County Water Conservation

Why Develop a Plan?

- Water is a Limited Resource
  - Limited and Variable Production from East Mountain Aquifers
  - Long-term Supply – Quality and Quantity Issues

Bernalillo County Water Conservation



Bernalillo County Water Conservation

- Reliable water supply for future generations
- State funding tied to water conservation plans
- Increases in one type of water use generally takes water from another use

East Mountains – 2

Bernalillo County Water Conservation

Water Sources	Population Served (Unincorporated County)
Albuquerque Bernalillo County Water Utility	35-40%
Domestic Wells	45-50%
Public/Private Utilities	15-20%
Well Shares	1% or less

US Census estimate for area population in 2000 is 106,000

Bernalillo County Water Conservation

Entities with Jurisdiction in East Mountain Area

- Bernalillo County
- Office of the State Engineer
- Public Regulatory Commission
- Soil and Water Conservation Districts
- Water Supply Utilities (Entranosa and others)
- New Mexico Environment Department

Bernalillo County Water Conservation

What Affects Residential Use?

- Availability
- Development Patterns
  - Age of Development
  - Lot Size
  - Landscape Type
- Household Size
- Cost of Water
- Weather
- Individual Practices

Bernalillo County Water Conservation

Population	Residential Water Use	Ave HH Size	Ave HH Water Use Per Day
Albuq – 510,000	126 gpcd (calculated)	2.4	303 gphd
El Paso – 563,000	114 gpcd	3.1	353 gphd
Phoenix – 1,321,000	165 gpcd	2.8	462 gphd
Rio Rancho – 60,000	116 gpcd	2.7	310 gphd
Santa Fe – 66,000	111 gpcd	2.2	244 gphd
E. Mtns (served by utilities) – 7,043	74 gpcd	2.6	193 gphd
E. Mtns (served by domestic wells) – 7,703	114 gpcd * * OSE Estimate	2.4	274 gphd

Bernalillo County Water Conservation

Demographic Data from Census 2000

East Mountains Population	14,896
Number of Households (HH)	6,048
Average HH Size	2.5
Single-Family Units	Pending
Multi-Family Units	Pending

Estimates prepared by Smart Use, LLC from multiple sources

Bernalillo County Water Conservation

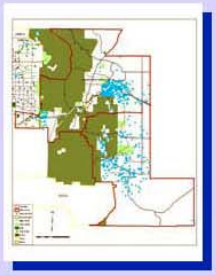
Water Supply in the E. Mountain Area	# Connections
Community Water Systems	2,709
Entranosa	1,771
Cedar Crest Area (Forest Park, Independent Utility Sierra Vista Mutual, Sierra Vista South, Mountain Christian Church)	650
Other Rural Providers (Chilili, Tranquillo Pines)	288
Water Hauling	150
Domestic Wells Estimated (residents not served by a community water system or a water hauler)	3,189
Domestic Well Permits (from OSE WATERS database)	1,920

East Mountains – 3

Bernalillo County Water Conservation

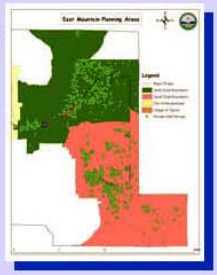
State Engineer's Office

Permitted Domestic Wells



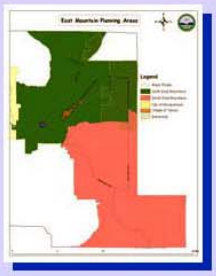
Bernalillo County Water Conservation

Bernalillo County Permitted Domestic Wells



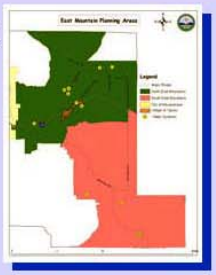
Bernalillo County Water Conservation

Entranosa Service Area



Bernalillo County Water Conservation

Other East Mountain Water Systems



Bernalillo County Water Conservation

Breakout Sessions Topics

What are your current water conservation practices?

What are the biggest obstacles to water conservation?

How can the County promote water conservation?

a. Reduction Goal
b. Incentives
c. Outreach and Education
d. Specific Conservation Measures

Bernalillo County Water Conservation

For more information or to provide additional suggestions:

Kerry Bassore, Bernalillo County Public Works
(505) 848-1552
kbassore@bernco.gov

THANK YOU!

South Valley – 1

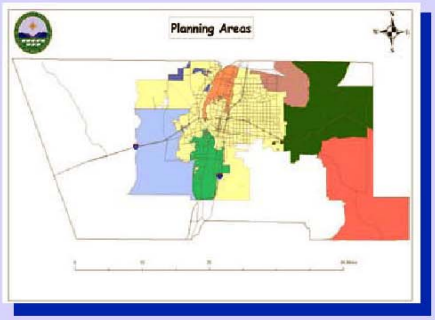
Water in Bernalillo County

Developing a Water Conservation Plan and Program

Bernalillo County Water Conservation

Why Develop a Plan?

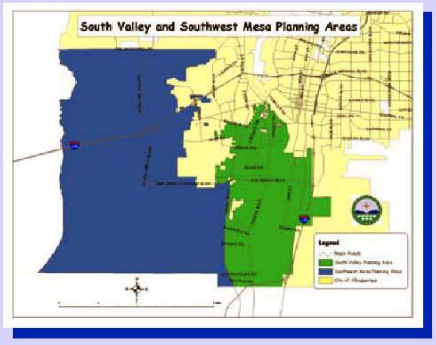
- **Water is a Limited Resource**
  - Aquifer Drawdown – 160' in 30 Years, Some Areas
  - Long-term Supply – Quality & Quantity Issues

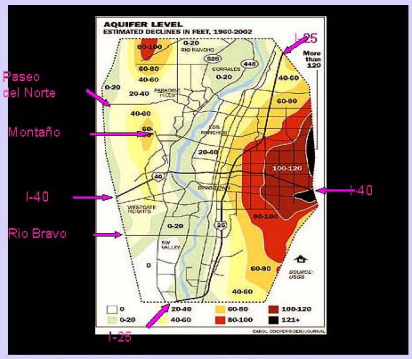


Bernalillo County Water Conservation

The Regional Problem —
Ongoing Deficit Spending of Water – *Past Quarter Century*

Source: Middle Rio Grande Water Planning Assembly





Drawdown of Aquifers in the Albuquerque Area, 1960 to 2000 *Source: U.S. Geological Survey, 2003*

South Valley – 2

Bernalillo County Water Conservation

- Reliable water supply for future generations
- State funding tied to water conservation plans
- Increases in one type of water use generally takes water from another use

Bernalillo County Water Conservation

What Affects Residential Use?

- Availability
- Development Patterns
  - Age of Development
  - Lot Size
  - Landscape Type
- Household Size
- Cost of Water
- Weather
- Individual Practices

Bernalillo County Water Conservation

Water Sources	Population Served (Unincorporated County)
Albuquerque Bernalillo County Water Utility	35-40%
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Bernalillo County Water Conservation

Population	Residential Water Use	Ave HH Size	Ave HH Water Use Per Day
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Phoenix – 1,321,000	165 gpcd	2.8	462 gphd
Rio Rancho – 60,000	116 gpcd	2.7	310 gphd
Santa Fe – 66,000	111 gpcd	2.2	244 gphd
South Valley – 46,407	122 gpcd	3.0	366 gphd
SW Mesa – 9,221	114 gpcd	3.4	388 gphd

Bernalillo County Water Conservation

Entities with Jurisdiction in South Valley and Southwest Mesa

- Bernalillo County
- City of Albuquerque
- Office of the State Engineer
- New Mexico Environment Department
- Albuquerque Bernalillo County Water Utility Authority
- Middle Rio Grande Conservancy District
- Soil and Water Conservation Districts
- Public Regulatory Commission
- Community Water Systems

Bernalillo County Water Conservation

Demographic Data from Census 2000

South Valley Population	46,407
Number of Households (HH)	15,234
Average HH Size	3.0

Preliminary estimates prepared by Smart Use, LLC from multiple sources

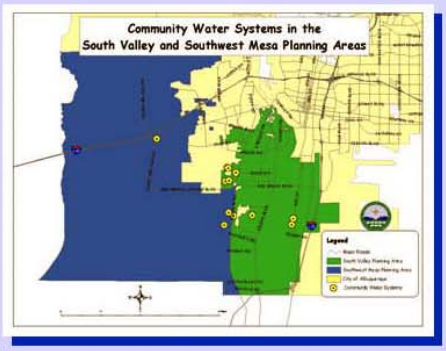
South Valley – 3

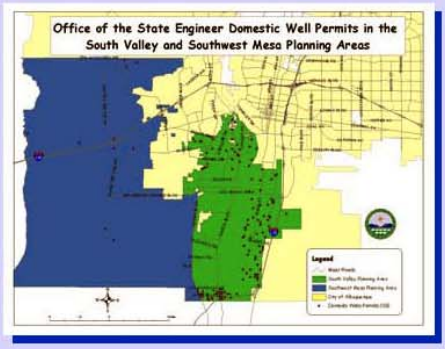
Bernalillo County Water Conservation

Demographic Data from Census 2000

Southwest Mesa Population	9,221
Number of Households (HH)	2,676
Average HH Size	3.4

Preliminary estimates prepared by Smart Use, LLC from multiple sources

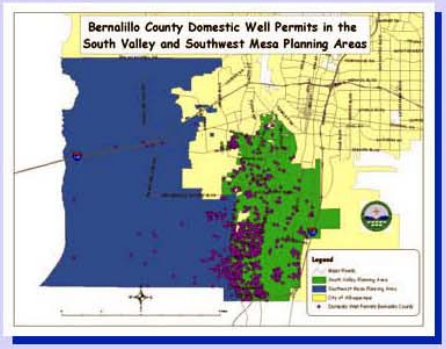




Bernalillo County Water Conservation

Water Supply in the South Valley	# Connections
Albuquerque Bernalillo County Water Utility Authority Utility Customers	9,121
Domestic Well Permits (OSE*)	327
Domestic Well Permits (Bernalillo County**)	798
Community Water Systems	790
Bakers Mobile Home Park	
Hamilton Mobile Home Park	
Mountain View Mobile Home Park	
Lisa Property Water System	
Toms Mobile Home Park	
Safariland Mobile Home Park	
La Mesa Villa Mobile Home Park	
Sunset Mobile Home Park	

* Based on available data ** Tracked since 1998



Bernalillo County Water Conservation

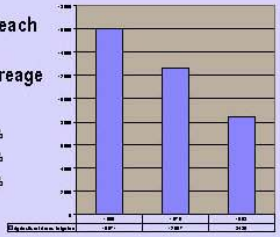
Water Supply in the Southwest Mesa	# Connections
Albuquerque Bernalillo County Water Utility Authority Utility Customers	159
Domestic Well Permits (OSE*)	243
Domestic Well Permits (Bernalillo County**)	140
Community Water Systems	574
Tierra West Estates Mobile Home Park	
Barcelona Mobile Home Park	
Desert Palms Mobile Home Park	
South Hills Water Co.	

* Based on available data ** Tracked since 1998

South Valley – 4

Bernalillo County Water Conservation

Albuquerque Reach Change in Agricultural Acreage



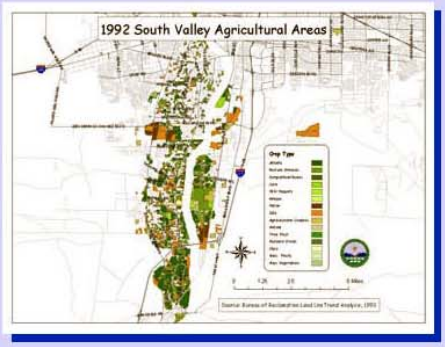
% Decrease	
1955 – 1975	21%
1975 – 1993	33%
1955 – 1993	47%

Bernalillo County Water Conservation

For more information or to provide additional suggestions:

Kerry Bassore, Bernalillo County Public Works
(505) 848-1552
kbassore@bernco.gov

THANK YOU!



Bernalillo County Water Conservation

Breakout Sessions Topics

What are your current water conservation practices?

What are the biggest obstacles to water conservation?

How can the County promote water conservation?

a. Reduction Goal
b. Incentives
c. Outreach and Education
d. Specific Conservation Measures

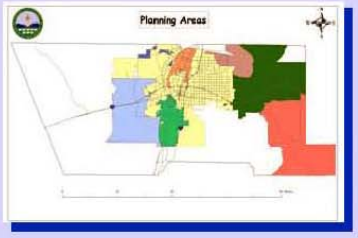
PRESENTATIONS – SECOND MEETINGS

Paradise Hills– 1

Water Conservation in Bernalillo County

Overview of a Draft Water Conservation Plan

Bernalillo County Water Conservation



Bernalillo County Water Conservation

Planning Process to Date

- 5 Public Meetings
- Water Usage Study
- Measure Analysis

Bernalillo County Water Conservation

Planning Process Next Steps

- Public Meetings
- Seek Adoption by County Commission
- Develop Water Conservation Ordinance

Bernalillo County Water Conservation

THEME 1

"We know water conservation is important."

Recommendation

Focus communication resources on specific conservation methods, i.e, "how to" reduce water use"

THEME 2

"Exploring the 'Why'."

Recommendation

Communicate the rationale for water conservation and resource limitations.

Bernalillo County Water Conservation

THEME 3

"We're already conserving."

Recommendation

Emphasize high-efficiency conservation techniques.

THEME 4

"We need more education on conservation issues."

Recommendation

Emphasize educational-informational communications

Paradise Hills – 2

Bernalillo County Water Conservation

THEME 5

"Don't mess with my well."

Recommendation

Recognize and promote individual responsibility.

Bernalillo County Water Conservation

THEME 6

"How can the County help?"

Recommendations

- Set a good example
- Conduct area-specific public education/workshops
- Offer incentives & rebates
- Develop tighter regulations
- Free water use audits
- Collaborate with public and private utilities

Bernalillo County Water Conservation

THEME 7

Water Quality

Recommendation

Conduct public education on water quality issues

Bernalillo County Water Conservation

THEME 8

"We need to control new development."

Recommendations

- Public education on growth and development
- Stricter ordinances and standards for new development
- Encourage low-impact development
- Offer water conservation incentives & rebates in new development
- Consider well metering

Bernalillo County Water Conservation

THEME 9

A Diverse Universe

Recommendation

Acknowledge the unique characteristics of the various areas in water conservation program planning

Bernalillo County Water Conservation

Difficulty of Implementation

Values	Hard	Medium	Easy
High	Address factors (6)	3	1
Medium	Address factors (7)	4	2
Low	Avoid	Avoid	Selective implementation (5)

Paradise Hills – 3

Bernalillo County Water Conservation

Value Driver Analysis

- Effectiveness/change in behavior, as shown in the following measures:
  - GPCD
  - Volume of water used by County residents
- Knowledge and understanding
  - Data Availability
    - Level of metering
    - Level of reporting to OSE on those with domestic well meters

Bernalillo County Water Conservation

Value Driver Analysis cont'd.

- Broad, equitable participation
- Political will/buy-in
  - Conservation-related ordinances passed
- Regional Synergy
  - Regional initiatives for conservation in which the County participates (i.e. lobby PRC on rates, work with other Counties for development standards for conservation)

Bernalillo County Water Conservation

Top Priority Recommendations

- Publicize existing requirements for new development, as well as measures put in to promote conservation
- Publicize incentive program
- Develop Bernalillo County rebate program with ABCWUA (toilets, high efficiency washing machines, irrigation controllers)

Bernalillo County Water Conservation

Top Priority Recommendations cont'd.

- The County could conduct a toilet distribution
- Agricultural incentives — educational materials
- Requirement for new development — choice of three approaches for water conserving devices (similar to new Albuquerque requirement)
- Amend subdivision code to require low water use landscaping

Bernalillo County Water Conservation

Vote by Participants

- Use three green stickers to vote for your top three recommendations
- Use three red stickers to vote for your three least favored recommendations

Bernalillo County Water Conservation

For more information or to provide additional suggestions:

Kerry Bassore, Bernalillo County Public Works
(505) 848-1552
kbassore@bernco.gov

THANK YOU!

North Valley – 1

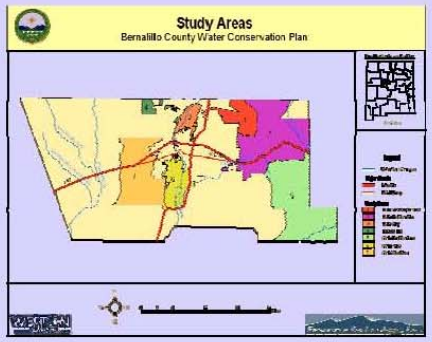
Water Conservation in Bernalillo County

Overview of a Draft Water Conservation Plan

Bernalillo County Water Conservation

Our Water Challenge

- Water table has dropped 180' in past 30 years in some places
- "Regional Water Budget" indicates we are "in the red"
- Increase in one type of use must come from another
- Conservation is cheapest, easiest source of new supply



Bernalillo County Water Conservation

Planning Process to Date

- 5 Public Meetings
- Water Conservation Plan
  - Current Water Usage Study
  - Overview of Mandatory, Voluntary Measures and Program Actions
  - Recommended Measures Reviewed and Prioritized
  - Communications Plan
  - Implementation Plan

Bernalillo County Water Conservation

Planning Process Next Steps

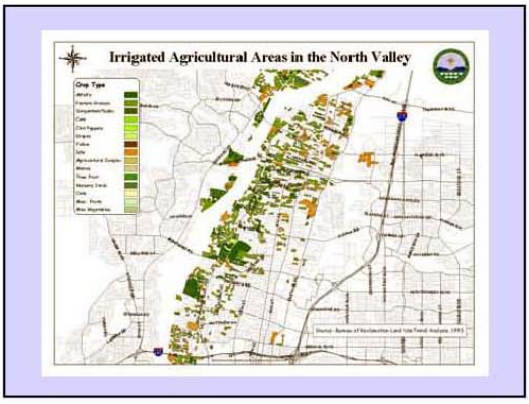
- Public meetings
- Incorporate public comments
- Seek adoption by County Commission
- Develop water conservation ordinance

Bernalillo County Water Conservation

Population Summary and Per-Capita Water Use for Utility Customers by Study Area

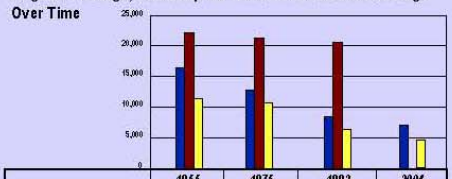
Category	North E Mtns	South E Mtns	NAA/Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Population[1]	13,059	4,354	9,465	6,783	29,957	45,279	7,181	107,519
Proportion of Population	12%	5%	9%	6%	19%	43%	7%	100%
# Households (HH)	5,191	1,353	3,715	2,568	7,956	15,385	2,259	38,947
Ave HH Size[2]	2.5	2.6	2.5	2.6	2.5	3	3.2	2.7
GPCD[3]	76	54	165	121	97	109	114	105

North Valley – 2



Bernalillo County Water Conservation

Irrigated Acreage, Consumptive Use and Estimated Recharge Over Time



	1955	1975	1993	2004
Irrigated Acreage	16,071	12,667	8,489	6,562
Consumptive Use (SWGW)	21,893	20,921	20,375	
Estimated Recharge	11,250	8,867	5,942	4,593

Bernalillo County Water Conservation

THEME 1

"We know water conservation is important."

THEME 2

"Why conservation?"

THEME 3

"We're already conserving."

Recommendation

Emphasize high-efficiency conservation techniques.

Bernalillo County Water Conservation

THEME 4

"We need more education on conservation issues."

THEME 5

"Don't mess with my well!"

Recommendation

Recognize and promote individual responsibility.

Bernalillo County Water Conservation

THEME 6

"How can the County help?"

Recommendations

- Set a good example
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Bernalillo County Water Conservation

THEME 7

Water quality.

Recommendation

Conduct public education on water quality issues

North Valley – 3

Bernalillo County Water Conservation

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"We need to control new development."

Recommendations

- Public education on growth and development
- Stricter ordinances and standards for new development
- Encourage low-impact development
- Offer water conservation incentives & rebates in new development

Bernalillo County Water Conservation

THEME 9

The county is diverse.

Recommendation

Acknowledge the unique characteristics of the various areas in water conservation program planning

Bernalillo County Water Conservation

Difficulty of Implementation

Values	Hard	Medium	Easy
High	Address factors (6)	3	1
Medium	Address factors (7)	4	2
Low	Avoid	Avoid	Selective implementation (5)

Bernalillo County Water Conservation

Value Driver Analysis

- Effectiveness/change in behavior, as shown in the following measures:
  - **GPCD**
  - **Volume of water used by County residents**
- Knowledge and understanding/data availability

Bernalillo County Water Conservation

Value Driver Analysis *cont'd.*

- Broad, equitable participation
- Political will/buy-in
- Regional coordination

Bernalillo County Water Conservation

Top Priority Recommendations

- Develop Bernalillo County rebate program with ABCWUA (toilets, high efficiency washing machines, irrigation controllers)
- The County could conduct a toilet distribution
- Publicize incentive programs

North Valley – 4

Bernalillo County Water Conservation

Top Priority Recommendations *cont'd.*

- Publicize existing requirements for new development, as well as measures put in to promote conservation
- Requirement for new development — choice of three approaches for water conserving devices (similar to new Albuquerque requirement)
- Amend subdivision code to require low water use landscaping
- Develop educational materials for agricultural conservation

Bernalillo County Water Conservation

MRGCD Water for Irrigation

The number of parcels receiving MRGCD water for irrigation (Strech, 2005) is as follows:

- Southwest Mesa — 31
- South Valley — 1,679
- North Valley — 1,275
- Total — 2,985

Bernalillo County Water Conservation

Potential measures for agricultural conservation

- Publicize existing financial support for agricultural conservation
- Develop program actions for agricultural conservation in conjunction with entities such as NRCS and MRGCD
- Use small business incubator to support increasing value crops through processing
- Develop incentives for growing more valuable crops requiring less water

Bernalillo County Water Conservation

Vote by Participants

- Use five green stickers to vote for your top five recommendations
- Use five red stickers to vote for your five least favored recommendations

Bernalillo County Water Conservation

For more information or to provide additional suggestions:

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Conservation Plan available at
http://www.bernco.gov

THANK YOU!

North Albuquerque Acres/Sandia Heights – 1

Water Conservation in Bernalillo County

Overview of a Draft Water Conservation Plan

Bernalillo County Water Conservation

Our Water Challenge

- Water table has dropped 180' in past 30 years in some places
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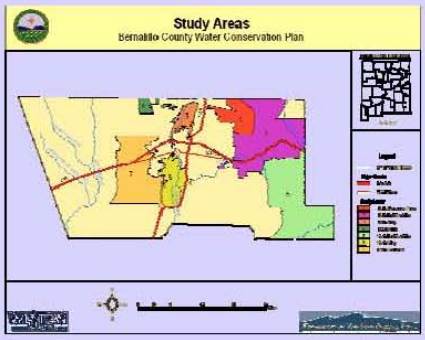

Bernalillo County Water Conservation

Planning Process to Date

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  - Communications Plan
  - Implementation Plan

Bernalillo County Water Conservation

Population Summary and Per-Capita Water Use by Study Area

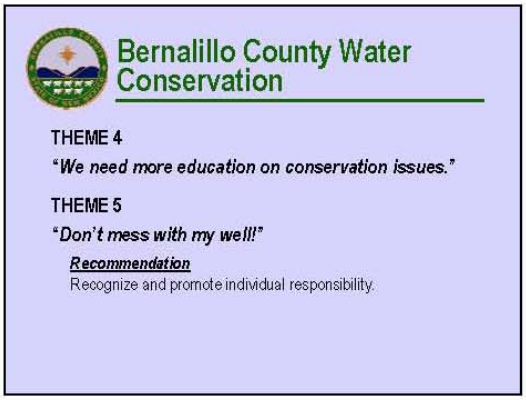
Category	North E Mtns	South E Mtns	NAA/Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Population[1]	19,150	4,854	9,405	6,788	20,067	46,229	7,161	107,569
Proportion of Population	12%	5%	9%	6%	19%	43%	7%	100%
# Households (HH)	5,191	1,863	3,716	2,563	7,965	15,385	2,259	38,947
Ave HH Size[2]	2.5	2.6	2.5	2.6	2.5	3	3.2	2.7
GPCD[3]	76	94	145	121	97	109	114	105

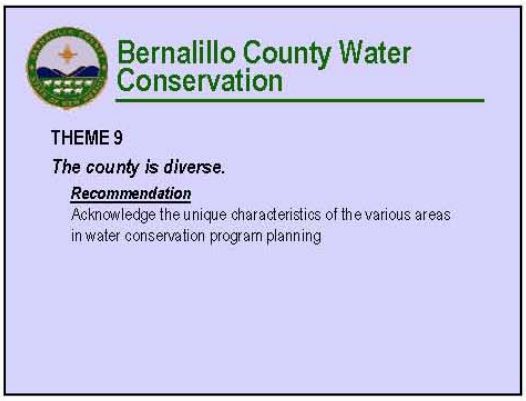
Bernalillo County Water Conservation

Planning Process Next Steps

- Public meetings
- Incorporate public comments
- Seek adoption by County Commission
- Develop water conservation ordinance

North Albuquerque Acres/Sandia Heights – 2





North Albuquerque Acres/Sandia Heights – 3

Bernalillo County Water Conservation

Difficulty of Implementation

Values	Hard	Medium	Easy
High	Address factors (6)	3	1
Medium	Address factors (7)	4	2
Low	Avoid	Avoid	Selective implementation (5)

Bernalillo County Water Conservation

Value Driver Analysis

- Effectiveness/change in behavior, as shown in the following measures:
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- Knowledge and understanding/data availability

Bernalillo County Water Conservation

Value Driver Analysis cont'd.

- Broad, equitable participation
- Political will/buy-in
- Regional coordination

Bernalillo County Water Conservation

Top Priority Recommendations

- Develop Bernalillo County rebate program with ABCWUA (toilets, high efficiency washing machines, irrigation controllers)
- The County could conduct a toilet distribution
- Publicize incentive programs

Bernalillo County Water Conservation

Top Priority Recommendations cont'd.

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- Amend subdivision code to require low water use landscaping
- Develop educational materials for agricultural conservation

Bernalillo County Water Conservation

Vote by Participants

- Use five green stickers to vote for your top five recommendations
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North Albuquerque Acres/Sandia Heights – 4

East Mountains – 1

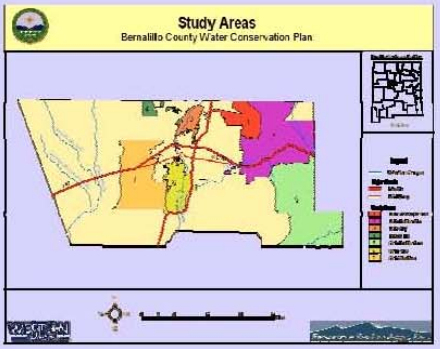
Water Conservation in Bernalillo County

Overview of a Draft Water Conservation Plan

Bernalillo County Water Conservation

Our Water Challenge

- Water table has dropped 180' in past 30 years in some places
- "Regional Water Budget" indicates we are "in the red"
- Increase in one type of use must come from another
- Conservation is cheapest, easiest source of new supply



Bernalillo County Water Conservation

Planning Process to Date

- 5 Public Meetings
- Water Conservation Plan
  - Current Water Usage Study
  - Overview of Mandatory, Voluntary Measures and Program Actions
  - Recommended Measures Reviewed and Prioritized
  - Communications Plan
  - Implementation Plan

Bernalillo County Water Conservation

Population Summary and Per-Capita Water Use for Utility Customers by Study Area

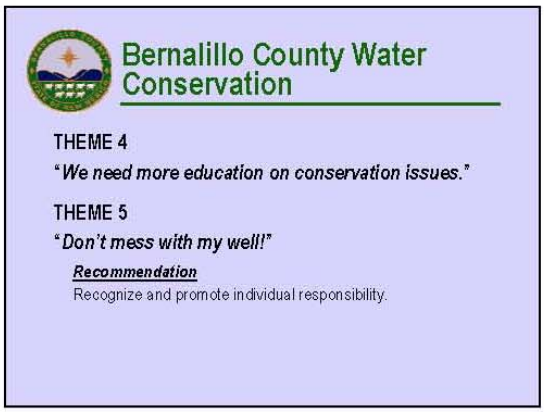
Category	North E Mtns	South E Mtns	NAA/Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Population[1]	13,050	4,354	9,405	6,783	20,067	45,279	7,181	107,619
Proportion of Population	12%	5%	9%	6%	19%	43%	7%	100%
# Households (HH)	5,191	1,883	3,715	2,568	7,965	16,388	2,259	39,947
Ave. HH Size[2]	2.5	2.6	2.5	2.6	2.5	3	3.2	2.7
GPCD[3]	76	54	145	121	97	109	114	105

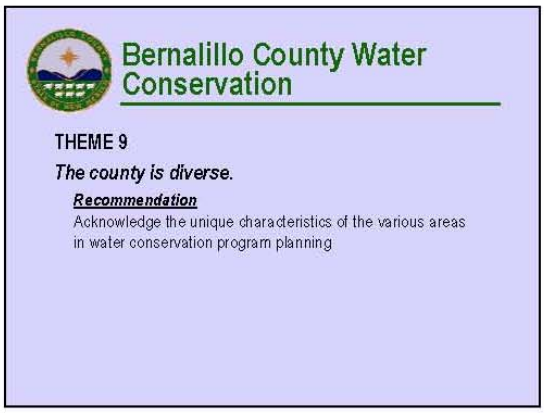
Bernalillo County Water Conservation

Planning Process Next Steps

- Public meetings
- Incorporate public comments
- Seek adoption by County Commission
- Develop water conservation ordinance

East Mountains – 2





East Mountains – 3

Bernalillo County Water Conservation

Difficulty of Implementation

Values	Hard	Medium	Easy
High	Address factors (6)	3	1
Medium	Address factors (7)	4	2
Low	Avoid	Avoid	Selective implementation (5)

Bernalillo County Water Conservation

Value Driver Analysis

- Effectiveness/change in behavior, as shown in the following measures:
  - GPCD
  - Volume of water used by County residents
- Knowledge and understanding/data availability

Bernalillo County Water Conservation

Value Driver Analysis cont'd.

- Broad, equitable participation
- Political will/buy-in
- Regional coordination

Bernalillo County Water Conservation

Top Priority Recommendations

- Develop Bernalillo County rebate program with ABCWUA (toilets, high efficiency washing machines, irrigation controllers)
- The County could conduct a toilet distribution
- Publicize incentive programs

Bernalillo County Water Conservation

Top Priority Recommendations cont'd.

- Publicize existing requirements for new development, as well as measures put in to promote conservation
- Requirement for new development — choice of three approaches for water conserving devices (similar to new Albuquerque requirement)
- Amend subdivision code to require low water use landscaping
- Develop educational materials for agricultural conservation

Bernalillo County Water Conservation

Vote by Participants

- Use five green stickers to vote for your top five recommendations
- Use five red stickers to vote for your five least favored recommendations

East Mountains – 4

South Valley – 1

Water Conservation in Bernalillo County

Overview of a Draft Water Conservation Plan

Bernalillo County Water Conservation

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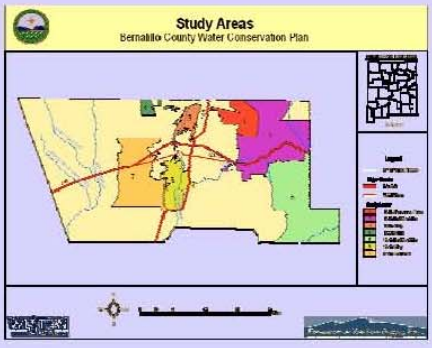

Bernalillo County Water Conservation

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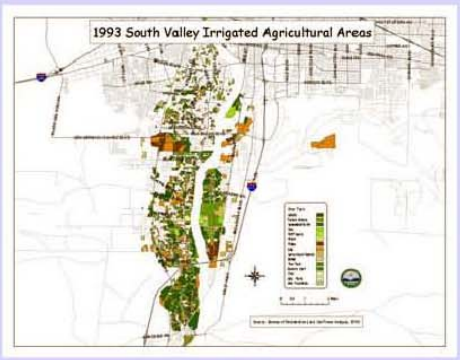
Category	North E Mtns	South E Mtns	NAA/Sandia Heights	Paradise Hills	North Valley	South Valley	SW Mesa	Totals for County
Population[1]	13,959	4,254	9,405	6,788	20,057	45,279	7,181	107,519
Proportion of Population	13%	5%	9%	6%	19%	43%	7%	100%
# Households (HH)	5,191	1,853	3,716	2,563	7,965	15,336	2,259	38,947
Ave HH Size[2]	2.5	2.6	2.5	2.6	2.5	3	3.2	2.7
GPCD	76	94	146	121	97	169	114	105

South Valley – 2



Bernalillo County Water Conservation

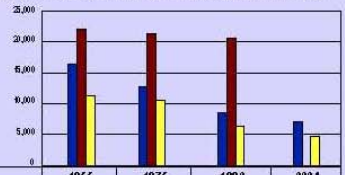
MRGCD Water for Irrigation

The number of parcels receiving MRGCD water for irrigation (Strech, 2005) is as follows:

- Southwest Mesa — 31
- South Valley — 1,679
- North Valley — 1,275
- Total — 2,985

Bernalillo County Water Conservation

Irrigated Acreage, Consumptive Use and Estimated Recharge Over Time



	1955	1975	1993	2004
Irrigated Acreage	16,071	12,667	8,489	6,562
Consumptive Use (SWIGW)	21,893	20,921	20,375	
Estimated Recharge	11,250	8,867	5,942	4,593

Bernalillo County Water Conservation

THEME 1

"We know water conservation is important."

THEME 2

"Why conservation?"

THEME 3

"We're already conserving."

Recommendation

Emphasize high-efficiency conservation techniques.

Bernalillo County Water Conservation

THEME 4

"We need more education on conservation issues."

THEME 5

"Don't mess with my well!"

Recommendation

Recognize and promote individual responsibility.

Bernalillo County Water Conservation

THEME 6

"How can the County help?"

Recommendations

- Set a good example
- Conduct area-specific public education/workshops
- Offer incentives & rebates
- Develop tighter regulations
- Free water use audits
- Collaborate with public and private utilities

South Valley – 3

Bernalillo County Water Conservation

THEME 7

Water quality.

Recommendation

Conduct public education on water quality issues

Bernalillo County Water Conservation

THEME 8

"We need to control new development."

Recommendations

- Public education on growth and development
- Stricter ordinances and standards for new development
- Encourage low-impact development
- Offer water conservation incentives & rebates in new development

Bernalillo County Water Conservation

THEME 9

The county is diverse.

Recommendation

Acknowledge the unique characteristics of the various areas in water conservation program planning

Bernalillo County Water Conservation

Difficulty of Implementation

Values	Hard	Medium	Easy
High	Address factors (6)	3	1
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Bernalillo County Water Conservation

Value Driver Analysis

- **Effectiveness/change in behavior, as shown in the following measures:**
  - **GPCD**
  - **Volume of water used by County residents**
- **Knowledge and understanding/data availability**

Bernalillo County Water Conservation

Value Driver Analysis ***cont'd.***

- **Broad, equitable participation**
- **Political will/buy-in**
- **Regional coordination**

South Valley – 4

Bernalillo County Water Conservation

Top Priority Recommendations

- Develop Bernalillo County rebate program with ABCWUA (toilets, high efficiency washing machines, irrigation controllers)
- The County could conduct a toilet distribution
- Publicize incentive programs

Bernalillo County Water Conservation

Top Priority Recommendations *cont'd.*

- Publicize existing requirements for new development, as well as measures put in to promote conservation
- Requirement for new development — choice of three approaches for water conserving devices (similar to new Albuquerque requirement)
- Amend subdivision code to require low water use landscaping
- Develop educational materials for agricultural conservation

Bernalillo County Water Conservation

Potential measures for agricultural conservation

- Publicize existing financial support for agricultural conservation
- Develop program actions for agricultural conservation in conjunction with entities such as NRCS and MRGCD
- Use small business incubator to support increasing value crops through processing
- Develop incentives for growing more valuable crops requiring less water

Bernalillo County Water Conservation

Vote by Participants

- Use five green stickers to vote for your top five recommendations
- Use five red stickers to vote for your five least favored recommendations

Bernalillo County Water Conservation

For more information or to provide additional suggestions:

Kerry Bassore, Bernalillo County Public Works
(505) 848-1552
kbassore@bernco.gov

Conservation Plan available at
http://www.bernco.gov

THANK YOU!

Attachment C - Notes from Public Involvement Meetings

PARADISE HILLS PLANNING AREA – MAY 5, 2005

Group PH #1

In attendance: seven residents

What could the County do?

What do you need to know that was not covered in the meeting?

- New Mexico Utilities well levels dropping
- Need to know more about the company (private, public, traded)

Should we be concerned about our water rights?

What are the biggest obstacles to water conservation?
Don't want to be told what to do (wells)

Cooperation with private utilities

City's poor example (watering the street)

Jurisdictional issues: What role does the County have?

Does agriculture use the largest quantity of water? Need better methods for farm irrigation.

What are the unintended consequences of conservation?

Volume discounts for golf courses?

- rate equity
-

Research golf courses that are using new systems that would decrease calcium buildup thereby reducing water use

There's room to conserve in all areas

New versus established developments

Tie water to development approval sequence

Change covenants re water use

Partner with conservation agencies

When will the water run out? (2050 with San Juan-Chama?)

What are the trade-offs to make it last longer?

NORTH VALLEY PLANNING AREA – MAY 19, 2005

In attendance: 15 residents. Residents were divided into two equal groups.

Group NV #2

What are your current water conservation practices?

Drip irrigation
Kept existing landscape
Have less turf irrigation
Do use drip irrigation for vegetables

Real turf (synthetic lawn, stays green all year)

Low-water-use fixtures and appliances (have a new home)

Retrofitting older home (following a water conservation audit)

Xeric landscaping

Rain barrels

My well – I monitor irrigation and outdoor watering

Stopping Zoysia grass—have eliminated it from border of lawn, but weeds grow in bare areas

Low flow- toilets

I didn't move to the North Valley to live in a gravel pit!

Smarter use of water

I have a 2-acre lot, but I put in landscaping only near my house

What are the biggest obstacles to water conservation?

No Enforcement—Time of Day Watering Restrictions or
Water Waste (particularly in Parks and on golf courses)
Water Waste is still a problem at Journal Center and other places.

When you cut off irrigation early (as you did last year) — people convert to wells

Problem: People use good water to irrigate.

Intel: They use too much
New housing doesn't have same amount of recharge of the aquifer as irrigated fields

The North Valley has cooler temperatures because of green space. If we eliminate the green space it will get hotter.

Swamp coolers use a lot of water

New housing is too dense (less than an acre)

What happens when agricultural land goes out of production?

Ditch systems are being taken out. What is the effect of the wells on the aquifer?

Where does recharge from septic go?

Poor attendance at meetings like this one – people aren't really interested

Are you sure this is not just a "Kangaroo Court" to get some information then force us to put meters on all of our wells? I'm not sure I trust you. This might be your way of putting more regulation on us.

What are your priorities & values about water conservation? (from handout)
Indoor Water Use—Households (new and older)
Religious/Cultural
Swimming Pools
Bosque

How can the County promote water conservation?
New Housing—Dual Water System (with some sort of incentive to put in a gray water system)

Design systems recapture water (like the old systems that captured rain off the roof)

There should be incentives for retrofitting your older home

Education - Educate people who move here from out-of-state and are used to grassy lawns.

The culture and way of living here warrant a different approach

We want less government control

We want choice. For example, we had to hook up the sewer. We had to pay for trash collection when it became available. And now we have to pay for recycling whether we do it or not. These programs should not be mandatory – we should get to choose whether we participate or not.

Study of catch basins or leach fields; this could be for public and private properties, such as cisterns at a school. Public buildings should lead the way.

Low impact design, such as the type of design currently being implemented for storm water runoff.

Offer a rain barrel incentive/rebate

Figure out how to help people succeed…for example, start a Water Conservation Corps and give people badges or caps.

Find out more about the wells through a voluntary incentive program --$50 off property taxes if you meter your well for one year and you check it and record results – not county.

Group NV #3
What are your current water conservation practices?
Xeriscaping
Water harvesting/rain barrels
Shorter showers
Using dishwasher less
Low flow fixtures/appliances
Monitoring water bill/checking for leaks
Monitor swimming pool/use cover
Avoid running water (dishes, brushing teeth)
Measuring/metering well use
New businesses must now have a water plan

What are the biggest obstacles to water conservation?
Plumbing problems in North Valley
Education/cost of using gray water
Liability issues of using gray water

Lack of social pressure
Renters' influence on property they rent
Lack of municipal support in multi-residential areas
Attitude of "why should I conserve when many others are coming into the community?"
Wells are not metered
More control on use/permits for new wells
Lack of comprehensive education program on where water comes from
Neighborhood covenants that require homeowners to have lawns
Concern that xeriscaping/conservation methods may lower property value

How can the County promote water conservation?
Recognize/reward low water users: Use less/pay less
Be consistent with neighboring jurisdictions
Decide how serious the County is about water conservation and what measure they will take
Educate children so the children will educate/pressure their parents
Promote green building technology for new construction/education for older construction
Develop a drought contingency plan for county w/"teeth" that can be enforced

Enforce ordinances
Encourage projects like community gardens
Ask the consultant to identify what the county is going to do about each one of the 43 recommendations in the regional water plan
Develop a credit/point system based on one's conservation that lowers property tax or offers other incentives/freebies (state fair tickets, etc.)
Establish a dedicated funding source for water projects

Water budgeting: 1st as a diagnostic measure, determine how much water we have/where it is coming from. 2nd find a way for use to be in balance with supply.

Develop an education program specifically for new comers to the area—maybe by distributing (maybe at the MVD) a comprehensive brochure describing why water conservation is important in our climate versus a wetter climate.

N. ALB. ACRES/SANDIA HEIGHTS PLANNING AREA – JUNE 2, 2005

In attendance: 18 residents. Residents were divided into two equal groups.

Group AA #4

What are your current water conservation practices?

Black/gray system put in when house was built.
Turn off faucet when washing dishes/brushing teeth.
Re-using household water
Rain-catching system
Xeriscaping/native plants
Limit lawn size
Formal well share agreements
Water audit
Low flow fixtures
Sprinkler timers
Pool covers

What are the biggest obstacles to water conservation?

Swimming pools & ponds
Evaporation
Lawns
Golf courses
Lack of incentives for county residents.
Well-owners see water as "free" (only pay utility bill – not water bill)
No enforcement of well usage reporting.
Lack of commitment/care
Lack of state engineer funding
Lack of standard well share agreements
Lack of education to newcomers.
Desire for aesthetic beauty of green
Sense of entitlement
Narrow view point

3 acre feet limit (for domestic wells) too high.
Non-New Mexican developers (don't understand)

How can the County promote water conservation?
A rate structure that includes incentives.
Tighten subdivision laws
Xeriscaping
Less sod
Education/incentives for gray water systems.
Lobby PRC to mandate water conservation efforts (for private water utilities)
Incentives for builders/developers.
Increase ESGRT tax from 1/8 to ¼ cent.
Grants for extending the utility incentive program.
Develop a drought plan.
Monitor parks & watering – Primrose Point.

Group AA #5
What are your current water conservation practices?
Water efficiently – use moisture probes, check for moisture level below surface of lawn and be efficient
Rain barrels
Low flow toilets
Full washing machine loads
Shorter showers
Shower with a friend
Water in morning & evening
-Morning only!
Very little grass, natural vegetation
Use dish water to water plants

What are the biggest obstacles to water conservation?
Ignorance
Apathy
Appliances in home should be "water efficient" appliances – toilets & dishwashers – but tend to be more expensive
No incentives on rebates (price)
No rewards for conserving (the less water you use, the more you pay)
People wasting water
Ice machines at convenience stores (cooling systems for machines can be wasteful
Compacts with Texas and other surrounding states
Lack of tax systems in place for "gray water"
Education
Xeriscape is more than just rocks

How can the County promote water conservation?
REDUCTION GOAL
People are concerned, 20% less water use within the city is proof

NUMERICAL GOAL
No, doesn't make sense. Goal has already been accomplished in City.

INCENTIVES
Nothing county could do to influence (custom home less than 20 yrs. old in Albuquerque Acres is already pretty efficient)
Mary requested a "water audit" when she bought her home…some others were interested.
Rebates
Sprinkler audit program
Water waste restrictions
Reminder/penalty assessed

OUTREACH AND EDUCATION
Water efficiently
Learn from outreach programs in City of Austin/Salt Lake City
- Humorous Commercials etc.
- Started with radio, TV and newspaper, ended with TV
- Rewarded businesses for conserving with special sticker

Continuous education – not just short bursts

New resident packet for people who are new to area
Youth education is very effective
Information in mailer every month
- Tips on how to save water

Reward businesses (car washes) for efficiency (City of Austin)
Measure water use (Use of measurement device helps people to remember and pay more attention to water use.

SPECIFIC CONSERVATION MEASURES
Watering times (water issues between Sandia Heights and Albuquerque Acres)
Washing full loads in dishwasher
Leaks in sinks
Brush teeth w/o running water
Don't let water run, small things

EAST MOUNTAINS PLANNING AREA – JUNE 7, 2005

In attendance: 57 residents. Residents were divided into four equal groups.

GROUP EM #6
What are your current water conservation practices?
Collect rainwater, snow melt (two 3,000 gal tanks)
- Outside watering

Tranquillo Pines
- Punitive rate for high water users
- People see how much water they use
- Info and mailers on conservation

2,000 gallon cistern – collects rainwater then is filtered for soft water

Rain barrel collects water/runoff from roof – outside water
Composting Toilets
Front Loading Washer
Heavy mulch on anything growing (no grass, no sprinklers)
Drip system
Forest Park
Users – 1,000 to 3,000 gallons month
    Above 3,000 gallons a month price goes up
Well monitoring a problem
Efficient appliances/fixtures
Efficient water mgmt system on new wells
People are intensely aware of water here, but not everyone knows or cares
Fix water leaks
Monitor home use w/meter
Flush less open
No running water when brushing teeth
Gray water recycling
Haul drinking water
Aerators on spigots
Restrict flow on showers
Xeric plants
Replace swamp w/air conditioners

What are the biggest obstacles to water conservation?
Conserving for whom?
Eminent domain – can take or lease water rights (change law)
No incentives or initiatives
Not worth it
Inertia or habit
New Mexico's water laws
    Nothing changed since 1970's – use it or lose it
We base way of living on standards from non-arid regions
Teach people: just because you can doesn't mean you should
Agriculture – major user -- farmers penalized when they save water
Bernalillo County - A1 or A2 zones
4 acres min sustainable size according study should go to A5 – A10
Low density housing
3 acre feet per domestic well
New wells – not always metered and who reads meter
CMA – ½ acre foot, not 3
Questionnaires w/tax bills to improve data gathering

How can the County promote water conservation?
Reduction Goals?
Because we monitor constantly we're aware
Promote transition
Rural co-ops & close wells (incentives); right now there are negative incentives
Feds – don't want adjacent communities tapping in forests, etc.

Read & understand use on bill
Carrot – co-op system; stick -- cost
More modern well systems use technology incentives
More education
TV – flyers – Entranosa – monthly newsletter
Start in schools
Children impact family
Transactions – houses – packets to educate seller and especially buyer on conservation
Raise taxes if you want to grow grass
Eliminate outside plantings
Foot print of house = size of lawn
Implement water conservation standards similar to county's current energy/building standards
Only water – saving appliance sold in county
New – retrofits should be plumbed with gray water systems
Agriculture – incentives to transition them to lower use
Remove regulatory hurdles – gray water systems and composting toilets

Group EM #7
What are your current water conservation practices?
Careful, garden in pots, pretty conservative
Only a few trees, a few flowers, do not let water run.
Pine trees (on drip) – cut down Willow tree (high water use)
Roses & fake flowers – small lawn – showers (not bath)
Given up with having to haul water
Engineers at Sandia gave good advice – learn about wells and take laundry to town
Conserve as much as possible
Do laundry in town – a few flowers – natural plants (live off of 14)
No outdoor – unless grey water, add low flow toilets and front load washing machines, low flow
showerheads -- live off front road near Sandia Knolls.
All neighbors and myself off of Crest Road – 8 houses – golf courses (Roger Cox) – for
Paako – 2 golf course wells were 200' – now over 300'
A few irises and trees
Entranosa serves us – low flow devices – seedlings on drip
Have property at Frost & Vecites - well was 2 gal per minute, retracted down to 1.75
150-200' drop in water level since 1973
Look at use in regard to age
Last 5 years or so newcomers also very concerned as well as longer term residents
Full sample – 75% very concerned
Very educational when your well goes dry.
Had 400 members to start water co-op – loan cancelled (1980)
Hot tubs are common in neighborhood – one has a swimming pool

What are the biggest obstacles to water conservation?
In late 70's and early 80's well problems began
Golf Courses
Population growth

Texas
Big communities (Roger Cox) do not realize the seriousness of the water issues…water from Entranosa – said would use effluent to water golf courses – but found it doesn't work.
1600 signatures opposing development – but passed anyway
Not development as much as uses
Priorities – Domestic water must be #1
KOA, Golf Courses, Swimming pool
Commercial development is big problem

How can the County promote water conservation?
In favor of larger lots
Zoning – need substantive review – to limit development (destruction) - moratorium for 6 months
See more education – for those not here tonight
How to save water
Campbell Ranch would be bad
If no way to enforce plan then just whistling Dixie
San Pedro Estates – Campbell and Paako
How do you get a feel for what is used –
    Need consumption #'s to know if too much is used.
    Time rates with high use – should skyrocket
How to reach new development residents with water conservation info.
Plan must be regional plan.

Group EM #8
What are your current water conservation practices?
Change landscaping to low water use.
Little or no landscaping
Low flow appliances
Limit shower times
Bottled water – quantity & quality issues
Rain barrels
Planting to eliminate erosion
Drip irrigation
Recycle washing machine water for plants
Recycle
Low flow shower heads
Utility

What are the biggest obstacles to water conservation?
Expense (cost of rain barrels)
Need, i.e., lifeline block
People want what they want, i.e., green lawns
Lack of education
Cost of water (drought restrictions)
Having to go to the laundry mat
    b/c not enough water (personal issue)

Water wells (not knowing how much you use, no meter)
Measurement of current water use

Discouragement, i.e., developer coming in and using water that neighborhood residents have tried to save for generations.

How can the County promote water conservation?
Tell people consequences if you DON'T

What should Bernalillo County Do?
Get rid of developers, as in stop developing areas where there is not a water supply
Not convinced that the water is coming in from another basin.
Doesn't matter – REGARDLESS – if the water is coming in from another basin, eventually that water will be gone too!
Listening to the history of this area. Historical knowledge of how things have changed over the years.
Historical Conservation Practices – water quality as a way of conserving the resource.

Incentives
Water use audit when you buy a new home (Free service)
<u>Would this be practical? Benefit?</u>

Yes, but won't push people to change. If it was offered at the right time, it would be beneficial.

Rain water harvesting
Give a discount on rain barrels - *rebates on purifying water systems

Education –
Restrictions don't work
Wouldn't be able to enforce in the East Mountains.
Education Program
Rebates offered to everyone that comes and participates in it.
Offered to the neighborhood residents

Group EM #9
What are your current water conservation practices?
Rain Barrels
Xeriscaping
"Ponding" – water harvesting
Drip irrigation
Low flow devices
Catchment tanks
Gray water
Close off water (brush teeth)
Shower strategies – teenagers
Brown & yellow = mellow
Wash (shower) in town
Erosion control
Reduce high water trees (downsize tree population)

What are the biggest obstacles to water conservation?
People
Lot size – prefer larger lots
Development
Money influences
Attitude – why conserve?
Lack of info – how much do I use?
Monitors
Lack of accountability
Population density
Cost of initial setup (gray water etc, low flow appliances)
Problems with logistics of gray water systems

How can the County promote water conservation?
Set good example
Improve (septic) systems drainage
Promote conservation strategies
Water harvesting
Modeling behavior
Incentives
Outreach, Education
Positive approach
Provide info "How to" – alternatives
Determine purpose of conservation
GRANT WRITER – quick! (and money)
Restrictions on landscaping – careful plantings
Codes for county – building etc.
Buy water rights, build pipe lines
Thin trees in National Forests (particularly Cibola and the Bosque)
Reduce 21,000 trees/acre

South Valley Planning Area – June 16, 2005

In attendance: 21 residents. Residents were divided into two equal groups.

Group SV #10
What are your current water conservation practices?
Rain barrels
Pumice Wick (conserve roof water)
Collect shower water
Field irrigation – 2 weeks
Low flow toilet
Wells useless water – my well doesn't produce enough
Slow careful watering – water evenings
Xeriscaping
Use bark in flower beds – hold moisture
Use swimming pool water for grass
Appropriate water for size washer load

What are the biggest obstacles to water conservation?
Lack of education
Don't care
Not everyone doing it – why should I?
Lake Myth
Knowing where to go for info (Resource Book)
Public education (well water) – what is an aquifer?
Incentives (restriction free)
Low flow toilet don't work well

How can the County promote water conservation?

Goal
- Good have goal (3)
- Threatening domestic wells won't work
- South Valley – here for the lifestyle – independent

Incentives
- $ Rebate
- Right now increase amt
- Use pay less disincentive
- Appliances
- Landscaping

Education & Outreach
- Adults & children
- School
- Radio
- TV
- Meetings
- Direct Mail
- 4 Domestic wells only
- Resource Guides
- Tough find meeting notice – Website – Links to web – other resources
- Learn from what other cities are doing

Specific measures
- City/County not serious – use water saved on new development
- Bullhead Park over watered
- Time of day water – restrictions
- Shut off sprinklers when raining
- Use more, pay more per gallon
- Reward outstanding conservation efforts
- How to workshops
- Area poor – do-it-yourself options (drip systems, water harvesting)
- Limit high density (Westgate Area)
- Golf Courses – Only water golf course greens
- No swimming pools – no municipal

Help understanding meters
Maybe audit

Unbiased

Opinion of refrigeration vs. swamp coolers
Penalties

Group SV #11

What are your current water conservation practices?

Drip irrigation
Landscaping & irrigation
Reuse water/reuse gray water for veggies
Gated Pipe
More efficient – doors
Use concrete ditch/land optimally leveled
Keep ditches clean
Reuse rain water
Limit showers and flushing toilets
Don turn on water on swamp cooler/use swamp cooler conservatively

What are the biggest obstacles to water conservation?

Lack of education
Cost of switching systems
New developers – government allowed to come in – residential & commercial
Lack of actual data/how to reference it
Army Corp of Engineers/MRGCD
Population growth

How can the County promote water conservation?

Limit development – size – growth
Implement SW area – make it a law
Plan & various sector plans
Education on:
- value of water
- value of agriculture
- recharge of aquifer
- value of wildlife

Promote projects like grower's market
Develop/protect open space
Develop mechanism to keep the ditches clean instead of relying on MRGCD
On going re-education of basic water principals
Be smart about change/eye to the future
Develop mesa in lieu of valley
Urban boundaries – like Europe – to preserve farmland
Give out/sell rain barrels
Use barley straw to avoid mosquitoes
Xeriscape education/provide incentives like tax write offs
Promote a program to provide retirement benefits
PSA – Simple messages (turn off water when brushing teeth)

QUESTIONS –

How much water is there?
How much does Intel Use?
Domestic well
Economic Develop
Standards for water use or jobs/income created
New development – residential & industrial – should do the utmost – have a higher standard – loyalty statewide to save water

Store more upstream somehow
Questions of solvents & pesticides getting into ground water

Notes from Public Meetings for Draft Water Conservation Plan

Notes from Questions and Comments Paradise Hills Community Center, 01/19/06

1. Community wells, not just domestic wells in Paradise Hills also an issue w/theme 5 ("Don't Mess With My Well"). Concern about City attempting to acquire Paradise Hills wells for city use.
2. Question of supply and demand.
3. Explain why conservation is necessary-numerically
4. When will demand exceed supply. Concerns about growth of population from the infrastructure perspective.
5. What water is there and what is available? Concern about water quality
6. Consistency between terminology – how do-acre-feet and gallons relate to one another.
7. Need to have consistency between terminology-acre-feet and gallons.
8. Jurisdictional issues, City of Albuquerque Areas growing around county area.
9. What is the cost of implementation and enforcement to the taxpayers?.
10. What goes into cost of water?
11. Cost of water influences how people behave.
12. Difficulty in knowing if use has reduced,-especially for [unmetered] domestic wells.
13. What is toilet water use relative to total household water usage of the whole house?
14. There are other, cheaper mechanisms for toilet savings than replacement
15. Concern about cost of toilet rebate to the taxpayer.
16. Concern about cost- equity of rebates and incentives, tax payers pay.
17. Does low-flow really save water?
18. Measures are too general.
19. Water conservation suggestion-get rid of water softeners.

Notes from Questions and Comments North Albuquerque Acres/Sandia Heights 1/25/06

1. Concern about North Albuquerque Acres and Sandia Heights being grouped together in same study area. Lack of data for domestic wells. Concern that a high GPCD would cause different regulations for different areas

2. Concern that low water use toilets don't have enough water to carry solids to septic system.
3. Want property tax reduction for people who conserve more.
4. Assess the amount of loss in small water systems(concern about infrastructure)
5. Should provide a rebate for graywater systems already installed
6. Thought that water conservation plan would be stronger if urgency was shown by providing more scientific data about water balance and when we would be running out of water based on growth.

Notes from Questions and Comments East Mountains 2/1/06

1. New development should require deeper (new) well to serve nearby area to lessen negative impact
2. There should be better definition of impact of new wells on nearby area regardless of # of lots being developed.
3. Can county provide visual of aquifer model?
4. When will regulation for new development be grandfathered in?
5. Treatment plants should be required in new subdivision in East Mountains and reinsertion into aquifer. Concern about water quality.
6. Low cost alternatives for conservation, such as cheap, natural way to filter grey water between househouse and cistern.
7. Plan should support small business development to promote conservation retrofits.
8. Use OSE website for information on rain water harvesting from roof.
9. Grey water information available in books and OSE website.
10. Is state funding available for residential conservation? Not for forgrey water-.
11. Need better data, especially on cost,cost effectiveness, water use and aquifer.
12. How far away is crisis?
13. What percentage do toilets use(of household use)?
14. Concern about water table dropping, increased population/growth: why should we conserve?
15. Who owns ground water?
16. Would love rebates, concern that South Valley metered wells are being charged by the city for use.
17. RV, camp grounds, swimming pools caused neighboring wells to go dry.
18. Should regulate large uses such as pools and golf courses.

19. Incorporate WW system in planning-concern about elevated nitnitrate levels from increased # of septic systems.
20. Grey water systems, health concerns, soil additives.
21. Creative approach to allow people to move/live out here (i.e. only allow high water use plants where grey water systems have been installed)
22. Need financial-cost estimate implications for tax payer and residents to implement measures.
23. Any benefit to existing well owners to provide data?(i.e. annual water quality testing)
24. County should look at inefficient sprinkler technology in home improvement stores.
25. Concern about water quality impact of septic systems.
26. Should be a central source for well data.

Notes from Questions and Comments North Valley 2/9/06

1. Don't Allow Swimming pools
2. Issue of equity relative to water rates. Currently there is no incentive for individuals to conserve, if they water a lot in the winter, they don't have to pay a conservation surcharge in the summer. Conservation surcharge should be based on a community standard or average.
3. Conservation for pools, spas and hot tubs
4. Use dollars to promote conservation and change behavior
5. What is the statutory basis for the County to have a water conservation plan? Or regulate domestic wells in any way?
6. Concern about wells drilled without a permit
7. Concern about landscaping company growing trees commercially
8. Don't plant tree if not necessary, - problem zoning for non-residential requires trees every 20 ft
9. Require more conservation in new development
10. Questions about industrial commercial and institutional measures
11. Major differenceCounty has no legal authority to regulate existing wells
12. Difference of opinions between attendees on wastefulness of domestic well users watering landscaping
13. Concern about water use by development and commercial users in Mesa del Sol
14. Mixed messages required to dedicated land for parks in Rio Rancho that use irrigation and turf while restricting landscaping in homes. Difference in message

from 10-15 years ago; now want people to tear out their landscaping and re-do-it with xeriscaping.

15. Ditch lining shouldn't be grouped with other measures
16. Consider limit on MRGCD on non-crop or livestock producing land
17. Urban vs Rural well user
18. Plant trees on west side of house to reduce evaporative air use.
19. People need education
20. No bleed off valves on swamp coolers
21. Swamp cooler replace with refrigerated air is expensive trade off for conservation, especially with the price of oil.
22. Mandatory measures need to be state-wide
23. Concern about equity – who is having to pay?
24. All water sectors should share effort and cost, not just residential
25. Have plumbers come and install toilet not just a rebate
26. Rebates are financially difficult
27. Make the dates for toilet rebates earlier (1985) to maximize full useful life of existing toilets
28. Put info on conservation in notice of value and tax bill
29. Educate realtors on acequias
30. Educate architect students on sustainability
31. Provide list of sustainability ideas for new buildings

Notes from Questions and Comments South Valley 2/16/06

1. How does this plan connect with AMAFCA/Corps of Engineer flood control project?
2. What happens to the water saved from the decrease in irrigated acreage?
3. Who gets the water we conserve?
4. SV is a riparian area not a desert you have to account for the differences.
5. All engineering projects need to account for recharge (i.e slow down water flow to allow time for infiltration into water table which can also improve water quality
6. Recognize recharge contribution of agriculturally zoned land.
7. There has been resistance to grassroots involvement in water management. (as evidenced by the MRG water assembly)
8. Is City involved in this? Fast growing areas on west side?

9. Effort in vain in light of fast growth in Rio Rancho, Valencia County, Sandia and Isleta Pueblos
10. Important to use graywater in new development
11. Concern about that requirement to bear cost of converting septic and graywater systems to ABCWUA
12. Is the County going to require meters on wells
13. No phreatophyte eradication funding left
14. Important to coordinate with other agencies
15. Well septic system is closed loop water goes back to the ground. Requirement to hook up to sewer counter to conservation.
16. How to keep County from saying wells are contaminated and condemning them
17. How can the County protect water rights to keep them from being sold across County lines (Socorro County has prohibited the sale of water rights outside the County)
18. Anyway to streamline graywater process? Tank for filtration resembles septic tank, extra cost will decrease compliance.
19. MRGCD water rights are not adjudicated and thus are hard for OSE to monitor
20. Need to look at how water is being used-major developments like Mesa del Sol and 55,000 acre development on west side.
21. Don't feel safe trusting government. Mixed message of conservation and keeping valley green.

Public Meeting Votes on Measures for the Bernalillo County Water Conservation Plan

	PH		NAA		EM		NV		SV		Totals		Percentage	
	G	R	G	R	G	R	G	R	G	R	G	R	G	R
Voluntary Measures														
1. Developing educational materials	2		2	1	3		2		1		10	1	0.91	0.09
2. Publicize incentive program	2		4		3		1		2		12	0	1.00	0.00
3. Develop a series of training programs in conjunction with the USDA Natural Resources Conservation Service (NRCS) for County residents on how to conserve without spending a lot of money, climate-adapted landscaping, and optimal irrigation practices	1		4		4		6				15	0	1.00	0.00
4. Develop educational materials on the various ground water basins (aquifers) in the County, drought, San Juan Chama impact and other items of interest to County residents			3		2		3		3		11	0	1.00	0.00
5. The County can subsidize metering for all (non-ABCWUA) utility customers that are not metered, either through new program funds, or by writing grants with the small systems for metering individual accounts		1	1	5	3						4	6	0.40	0.60
6. The County should design technical workshops with the assistance of the New Mexico Rural Water Association (NMRWA) and the Rural Community Assistance Corporation (RCAC) (one set geared for small utilities and the other for community water systems) to address the issues most relevant for the water system				3	1	1	3			2	4	6	0.40	0.60
7. Toilet rebates program with ABCWUA		1	8		2	2	7	1	1		18	4	0.82	0.18
8. The County could conduct a toilet distribution with three distribution points, North, South and East		1		2	2	1					2	4	0.33	0.67
9. Establishing a five-tier system for water smart homes, allowing commercial homebuilders to use it as a promotion, and then recognizing homebuilders for the number of water smart homes they sell	1		5		5	4	4	1	1		16	5	0.76	0.24
10. Upon inspection and thus verification of installation of stub-outs for a grey water system, the County would issue a check to the homebuilder	1		2		4	1	7		1		15	1	0.94	0.06
11. For existing businesses, the County could put together a recognition program for businesses that take measures to save water			2		1		2		1		6	0	1.00	0.00
12. Assist mobile home parks in sub-metering (education)					1		1	1	1		3	1	0.75	0.25
13. Assist smaller utilities in meter testing and repair (education)	1	1	3		1						5	1	0.83	0.17
14. Assist smaller utilities in determining amount of non-revenue water (education)								4			0	4	0.00	1.00
15. Leak detection audits for small utilities		1	3		1						4	1	0.80	0.20
16. Leak detection audits for small utilities' customers (provide audits or incentives)		1			1		1				2	1	0.67	0.33
17. Assist smaller utilities in tracking spikes and anomalies (education)											0	0	#DIV/0!	#DIV/0!
18. Develop Bernalillo County rebate program with ABCWUA (toilets, high efficiency washing machines, irrigation controllers)		1			3	2	6		3		12	3	0.80	0.20
19. Develop Bernalillo County rebate program for County only (toilets, high efficiency washing machines, irrigation controllers)		1	6		2	2	3				11	3	0.79	0.21
20. Develop rebate & incentive program for PIPE program participants					1						1	0	1.00	0.00
21. Toilet distribution program			3	1	1	4	1		3		8	5	0.62	0.38
22. Develop County rebate program for residential (irrigation controllers, cisterns, grey water system)			11		3		2		1		17	0	1.00	0.00
23. Outdoor rebate program for new development - rainwater harvesting system, irrigation efficiency, cistern, water conserving site design, treatment and re-use of water on-site (system)	1		3		4		2				10	0	1.00	0.00
24. Outdoor rebate program for new development				2	3		1			1	4	3	0.57	0.43
25. Outdoor/indoor rebate program for new development			3		1	1	1			1	5	2	0.71	0.29
26. Audits for residential	2		3	3		2	3			4	8	9	0.47	0.53
27. Agricultural incentives - promote value-added crops - small business incubator, conversion to more valuable crops, ditch lining, laser leveling fields	1		4		1		14			6	20	6	0.77	0.23
28. Agricultural incentives - educational materials	1			1			9		1		11	1	0.92	0.08

	PH		NAA		EM		NV		SV		Totals		Percentage	
	G	R	G	R	G	R	G	R	G	R	G	R	G	R
Voluntary Measures														
Program Actions														
1. The County should first measure a baseline of current water use for County facilities	1		2		2				1		6	0	1.00	0.00
2. Develop new irrigation schedules for minimizing evapotranspiration (ET).					1				2		3	0	1.00	0.00
3. Repair and maintenance to look at areas such as preventing leaks, replacing sprinkler heads and keeping grass slightly taller to minimize			2		2		4		2		10	0	1.00	0.00
4. Xeriscaping at demonstration sites as educational support		1	5			2	2			4	7	7	0.50	0.50
5. County develops conservation goals			1			1	1		1		3	1	0.75	0.25
6. Publicize County-wide conservation goals					1		2		2		5	0	1.00	0.00
7. Publicize County Water Conservation plan			2				3		2		7	0	1.00	0.00
8. Engage with County leadership on Conservation plan, message and implementation			1			4					1	4	0.20	0.80
9. Publicize existing requirements for new development, as well as measures put in to promote conservation			1	2	5			1	1		7	3	0.70	0.30
10. The County should survey the small utilities and community water systems to describe existing conservation measures, training required to improve conservation, the accounting methods, level of metering for individual accounts, rates, and other charges	1		1			1		4	2		4	5	0.44	0.56
11. The County should develop relationships with the various systems and utilities to promote conservation and identify ways to reach residents that are non-ABCWUA utility customers	1		1		1		5				8	0	1.00	0.00
12. Work with the individual systems to improve information gathering, water accounting and leak detection (for systems and for individual accounts)			2		2		1	1	1	1	6	2	0.75	0.25
13. Retrofit County Facilities (indoor fixtures)			3			1					3	1	0.75	0.25
14. Assist smaller utilities in grant-writing					7				1		8	0	1.00	0.00
15. Work regionally for PRC conservation rates				1		1		1			0	3	0.00	1.00
16. Work regionally for MRGRWP implementation of water conservation elements				1	1		2			2	3	3	0.50	0.50
PA Write-ins														
Coordinate to reduce de-water from AMAFCA flood Control									5		5	0	1.00	0.00
Look at entire MRG watershed as a system									10		10	0	1.00	0.00
Develop firm policy to ensure Ag stays in Valley									7		7	0	1.00	0.00
Coordinate Graywater to use existing septic tanks									6		6	0	1.00	0.00
Mandatory Measures														
1. Publicize new mandatory measures	1			1	4		2		3		10	1	0.91	0.09
2. Review the ordinances in place that relate to water conservation for the ABCWUA, adapt them for use by the County, and go through the process of review for potential adoption.			1	5		3	1		1		3	8	0.27	0.73
3. Implement ABCWUA ordinances	1		1	8		4	1	10		3	3	25	0.11	0.89
4. Time of day restriction	1		9	2	1		10	1	3	3	24	6	0.80	0.20
5. Water waste ordinance		1	6	2	2					2	8	5	0.62	0.38
6. Requiring a meter for those who have four instances of water waste violations			1	6	2	7	2	7		16	5	36	0.12	0.88
7. Implementation of limitations on high water use landscaping.					2			11			2	11	0.15	0.85
8. Enforce 80/20 landscaping requirement		1	3	7		2		12	1	4	4	26	0.13	0.87
9. Implement design regulations for conservation and apply to County facilities and golf courses and new development in unincorporated area.			1		15		2		4		22	0	1.00	0.00
10. Implement irrigation system standards for existing golf courses, athletic fields, golf courses and new development (excepting single family residential)	1		3	1	15		8		4		31	1	0.97	0.03
11. Implement water budgets for County and private golf courses, and to all County- owned parks and athletic fields			8	1	9		6		4		27	1	0.96	0.04
12. Implementation of an ordinance requiring retrofit on resale or remodel – for the remodel portion, the requirement for low flow devices would be added to a permit required for plumbing retrofit		3	1	11		4	1	12		8	2	38	0.05	0.95

	PH		NAA		EM		NV		SV		Totals		Percentage	
	G	R	G	R	G	R	G	R	G	R	G	R	G	R
Voluntary Measures														
13. Implementation of requirements for new development to have a zero footprint might be more politically difficult, and should probably be developed in conjunction with the ABCWUA and the Homebuilders Association			2		12	1	1	3	2	2	17	6	0.74	0.26
14. Require conservation measures for homes over a certain size, starting at 2,500 square feet		2	2	9	1	4		4	4	3	7	22	0.24	0.76
15. Require more stringent conservation measures for homes over 3,000 square feet			2		4	3	2		1	2	9	5	0.64	0.36
16. Promoting grey water systems through mandatory measures.				5	2	5		4	4		6	14	0.30	0.70
17. Requirement for new development - choice of three approaches for water conserving devices (similar to new Albuquerque requirement)			1	5	3	4	5		1		10	9	0.53	0.47
18. Amend subdivision code to require low water use landscaping	1		3	1	6			2	6	1	16	4	0.80	0.20
19. Require conversion to low-flow devices by certain date for existing businesses	2	1	4	4		1		9	1	4	7	19	0.27	0.73
MM Write-in											0	0	#DIV/0!	#DIV/0!
No New development									19		19	0	1.00	0.00
No New Golf Courses									16		16	0	1.00	0.00
No Sales of Water Rights Outside the County									13		13	0	1.00	0.00

Attachment D – Sample of Water Values Survey

Water in Bernalillo County

Developing a Water Conservation Plan and Program

Please rank the following items in order of importance to you. Rank from 1 to 13 (1 being most important)

___ Watering Existing Yards and Landscaping

___ Community Parks and Sports Fields

___ Indoor Use in Existing Homes

___ Recreation, such as Fishing and Rafting

___ Irrigation for Farms

___ Indoor Use in New Housing Developments

___ Cultural and Religious Uses in Some Villages and Pueblos

___ New Industrial Uses, such as Manufacturing Processes

___ Swimming Pools for Individual Homes

___ Use for Yards and Landscaping in New Developments

___ Providing Food and Refuge for Fish, Birds and Other Animals

___ Watering Golf Courses

___ Preserving the Bosque

Attachment E -- Written Water Conservation Suggestions from East Mountains Public Meeting

Suggestions for Conserving & Preserving Water

Presented by Ralph Powell (docralpho@aol.com) at East Mountains Public Information Meeting

Fix all known water "leaks", dripping faucets, "running toilets" and the like. Monitor multi-house water systems with individual water meters to better evaluate individual usage and potential system leaks.

Replace any 5 gallon flush toilets with low-flow toilets (1.6 gallon).

Flush less often, especially urine which is 95% water anyway. Men-use a deep plastic container and dispose down a sink, chase with small amount of water. If you work in town, use facilities there when possible.

Turn off water while brushing teeth. If you plan to shave/wash face, turn on hot side first to brush teeth (water may initially be cold). Then less water is wasted while waiting for hot water to wash face or shave as you used some of that initially cold water (from the hot side) for brushing teeth.

Use Laundromat in town, not water-wasting washer. Replace water-wasting washer with newer water-saver variety (most are front-loading). Wash only "full" loads. Same for dishwashers.

Catch rain water off roof for watering plants. Consider a storage tank and delivered water for outdoor use.

Recycle water when possible, e.g., use "grey water" from sinks, showers, & washers for outside watering.

Do not leave hoses on outside, or allow water to run down the street.

Haul your own drinking water. Pure Water Technologies (275-6777) provides good drinking water.

Install flow restricting devices on all showers placed just prior to the showerhead. These typically cost $3-4 and can shut water off at the showerhead completely, or gradually increase water flow with a sliding lever.

Install aerators on all spigots (these mix air and water and help reduce amount of water used at a sink); they screw onto the end of a spigot. Place a water purifier on kitchen spigot (e.g. made by PUR) to reduce flow.

Take showers not baths, and less of them. Take a "Navy" or "GI" shower—get wet, stop water, soap down with water off, then rinse off.

Do not use hot showers in winter as a means of warming up via an extended shower. Buy a sweater or sweat pants/shirt, or PJs instead. Same for hands and feet.

Minimize water use when washing hands and dishes. Restaurants can use 6 times the amount of water served to wash the glass it was served in. Avoid doing this. Wash single or a few items with cold water; don't "wait" for hot water just to rinse a glass or two.

Water outdoors only during coolest time possible to minimize evaporative losses; use drip irrigation. Mulch plants with compost, leaves or bark. Plan xeric plants or "natives" that can eventually sustain themselves with natural rainfall. Avoid ponds, hot tubs and lawns unless then can be sustained by rainwater.

Visualize yourself having to haul every drop of water you use—you may have to if the drought continues.

Availability then may be scarce if everyone is hauling water. Thus, try to "save" as much water in the ground as possible. Install a water meter so that you can monitor your water use and seek to reduce it.

Replace "swamp coolers" ("evaporative coolers") with "real" air conditioners. Use spot cooling with portable units. Be sure water supply lines and swamp coolers are not leaking, and shutoff valves work properly. Use swamp coolers on "fan only" early in morning or late at night to circulate outside cool air.

Wash autos in town at a car wash there.

Insulate hot water lines between heater and faucet to decrease wasted water while awaiting hot water at faucet. Keep distances short (from hot water heater to faucet). Obtain circulating device or point of use heater so not to waste water waiting for hot water to reach faucet. While waiting for hot water in a faucet, catch the initial cold water in a bucket and use to water plants or other use, not just waste it down a drain.

Turn off water to house when away on trips/vacation to prevent potential for water loss due to a break in a pipe. Prevent water pipe freezing in winter, and loss of water as a result.

Don't leave faucets on and run to answer a phone or doorbell; turn water off first.

Teach your children and your neighbors about conservation of water and "walk the walk" yourself.

Be also alert to items that can contaminate ground water—do not dump oil or gasoline outside; avoid use of pesticides; clean up after animals; prevent oil-leaking vehicles from spilling onto the ground; don't flush radiators outside; avoid washing paint brushes so paint or stains can contaminate soil. Don't store hazardous substances outside in containers that can leech into the ground. Remove dead animals.

Consider water conservation and preservation to be "life style changes" not a "temporary fix". Be aware many small acts felt unimportant to conserve water actually add up to saving significant amounts of water.

Some predict wars will be fought over water rights to fresh water. Limit your use and conserve our future!

APPENDIX H
INCENTIVE PROGRAMS REVIEWED – LESSONS LEARNED

Economic and Incentive Programs Currently in Place

Prepared by Smart Use, LLC

Below is a list of the BMP's and other incentive strategies that were reviewed. All of these programs are being implemented in multiple locations. Cost benefit evaluations have been conducted on these programs in other areas and the savings in water, energy and cost is available from other areas. There are also formulas available that have been used by other entities that the County could use to calculate savings on an annual basis for any programs that are implemented.

NOTE: Strategies already being implemented by the Water Utility Authority are in blue

Name	Description	Target Group(s)	Comments
RESIDENTIAL AUDIT AND RETROFIT			
Residential audit and retrofit program	Conduct water audits and retrofit showerheads & aerators; educate customers;	Single and multi-family residences	Longer term payback; significant administration required; popular with the public
Ultra Low Flow Toilet (ULFT) retrofit	Provide rebates for retrofitting high flow toilets with low flow models	Can be targeted or apply to all users	This is the only toilet retrofit program done by the Water Utility Authority
ULFT distribution	Conduct large toilet distribution events, usually held at a high school with hundreds of toilets given away in a single day	Can be targeted or apply to all users	Can be done in cooperation with a community group
Leak detection	Target high usage accounts or spike usage; help detect leaks; also do retrofit while there	Can be provided to all users	Very popular with customers; can save substantial amt of water per site
Leak repair	Financial assistance with leak repair	Usually targeted to low income families	Could be done in coordination with other programs like Red Cross or Senior Affairs programs, both of which already provide assistance with leaks. The Red Cross is an

			"Emergency Repair Program which is funded by the City
DEVICES AND EQUIPMENT			
High efficiency washing machines	Rebate	Can be targeted or apply to all users	New Energy Bill sets Nat'l standards but won't have impact for many years
Swimming pool and spa covers	Rebate program to limit evaporation	Can be targeted or apply to all users	
Efficient hot water systems	Usually several options such as hot-water-on-demand, recirculation; ordinance or rebate	Can be targeted or apply to all users	
COMMERCIAL/IND. INSTITUTIONAL			
Restaurants	Full audits or retrofit of pre-rinse nozzles; rebates for efficient ice machines and refrigeration systems	Food service establishments	
Medical	Rebates for steam sterilizers, cooling systems		
Commercial, Industrial and Institutional customers	Commercial and industrial audits; rebates for industrial re-use projects, cooling system efficiency, industrial process efficiencies	All Comm, industrial and institutional	County could provide funds or technical assistance
LANDSCAPE/ IRRIGATION AND AGRICULTURAL			
Landscape rebate	A rebate, usually per square foot (SF), for replacing turf with xeric & drip	Usually for residential; can also be for commercial/ industrial	Success is tied to size of rebate per square foot – range is .25 - $1.00/SF
Large user irrigation audits	Irrigation system efficiency; watering schedules; check system components; in some communities an annual audit is mandated for irrigated areas over a certain size, for example, 10	Commercial/ industrial or institutional sites with large	Advice only; popular program; very effective for large landscapes

	acres.	landscaped areas	
Agricultural/ Livestock audits	Audit of irrigation system efficiency for agricultural purposes;	Water used for agriculture or raising livestock	Already part of extension service; could be expanded
Agricultural	Land leveling, ditch lining and other measures	Agricultural users	Shared funding through the Natural Resources Conservation Service (UDA)
Weather sensors	Rebate to increase usage of weather (rain) sensors to stop irrigation when not needed	Can be targeted or apply to all users	Public acceptance high
WATER UTILITY PROVIDER INITIATIVES			
Distribution system pressure regulation	Required by BMP's to improve efficiency of water use	Water utility providers	County can provide technical assistance or leadership in bringing the utilities together to explore feasible and desirable programs.
System water audit	Reduce unaccounted for water though leak detection, repair and system maintenance	Water utility providers	
Wholesale supplier incentives	Technical assistance and incentives for conservation	Water utility providers	
MISC PROGRAMS & REGULATIONS			
Gray water use	Wide range of incentives to promote use of gray water for cooling, irrigation, industrial	Can be targeted or apply to all users	State has a law on gray water; issues may be complex; requires coordination

Best Management Practices

The California Urban Water Conservation Council and the Texas Water Development Board are two large entities that represent many water utilities and large geographic and population centers. Both have developed a set of water conservation Best Management Practices. These practices were developed through extensive research of what works and what doesn't, which programs and policies actually result in water savings, which programs have been successfully implemented and legally tested, and which programs are acceptable to constituents and user groups. Although the BMP's for

these two groups were developed independently of each other, they are almost identical in the common areas they cover. Both groups have spent considerable time in defining implementation strategies and cost saving evaluation methodologies.

In addition to the common areas covered by the BMP's, the Texas Water Development Board has also developed BMP's for agriculture that are not included in the California BMP's. These standards are generally directed at larger agricultural sites than those found in Bernalillo County but the USDA Natural Resources Conservation Service already has programs to help agricultural users in the County to conserve water. The Cooperative Extension Service also provides educational programs and the County should coordinate any educational programs dealing with agricultural or irrigation use with them.

In California the BMP's are a requirement of the member utilities, while in Texas they are required to be incorporated in water conservation plans in each of the State's water districts, but no specific BMP's are required. Each district can choose the BMP's most helpful to their specific needs and resources.

Many of the listed programs can be implemented in several different ways. Rebates and incentives, which are voluntary and reward the participants, are usually more costly and have far lower participation rates, but they are more readily accepted politically and more popular with the public. The best management practices or "standards" include both incentives and ordinances, and often, the water provider can select the method they prefer for meeting the standard. For example, a standard that requires retrofit of high flow toilets can be done by incentive (rebates), as it is done in Albuquerque, or by ordinance, as it is done in Santa Fe.

The Best Management Practices adopted by these two groups are a good basis for designing water conservation strategies because they been well researched and consistently implemented in other communities. In addition to the BMP's of these two groups there are strategies that have been adopted and implemented in other jurisdictions that should be considered as well.

WATER USE CHART - INDOORS

Device	Proportion	Average Amount Used	Savings with retrofit
Toilets	Largest indoor user/26.7% of non-conserving household	18.5 GPCD	9.7-27.5 GPCD (depending on age of toilet to be replaced –applies to 1.6 gpf replacement toilets)
Showerheads	Third largest indoor user/16.8%	11.6 GPCD	0.9-14.1 (depending on age of showerhead to be replaced)
Faucets (kitchen & lavoratory)	Fourth largest indoor user/15.7%	10.9 GPCD	5.4-18.9 GPCD (1.5 gpm faucets replacement; savings dependent upon age of faucets to be replaced)
Clothes Washers		39 gallons per load (gpl) – washers manufactured between 1980 and late 1990s averaged 43-51 gpl	27 gpl replacement saves 4.4 GPCD
Water Softeners[21]		5 GPCD (regeneration)	Demand control softeners can more precisely use water only as necessary for regeneration

DISCUSSION OF REBATE AND INCENTIVE PROGRAMS

Rebates: Consumer purchases an eligible low flow item; upon confirmation of eligibility, all or part of the cost is rebated to the consumer, usually by the water utility company in the form of a credit on the water bill.

[21] NMOSE, 2001 (A Water Conservation Guide for Public Utilities)

Pros:

- Voluntary and provides a reward as opposed to an ordinance that mandates the low flow item.
- Checks do not have to be issued – a credit is applied to the property tax bill
- Implementation can be achieved by working with the Water Utility Authority to piggyback on their existing programs

Cons:

- Often not utilized as much by low income recipients because the money has to be paid up front before getting the rebate
- Sponsor has to deal with each customer individually
- Confirmation of eligibility can be costly for the consumer and/or the utility

Coupons: A coupon is provided for a low flow washing machine, swimming pool cover, low flow toilet, hot water recirculating system or other device; coupon is only given to customers after verification of eligibility (usually thorough water account number); customer takes coupon to a retail partner who redeems the coupon; retailer bills the sponsor monthly.

In some cases the sponsor doesn't even pay for the coupon; it's absorbed by the business. For example, in Las Vegas, Nevada, a $2 coupon is available for a car wash at all participating car washes at not cost to the water providers. The Water Smart Car Washes (which nearly all are) absorb the coupons as part of their marketing costs.

Pros:

- Much easier to deal with a few partners on a monthly basis than dealing with each customer individually
- Retailers have incentive because it brings in customers
- Rebate to the customer is instant – no out of pocket cost
- The High Efficiency Washing Machine program is already set up for retailers to process the credit as a reduction in price so the customer doesn't even need a

coupon; the same concept could be used for other devices in partnership with the retailers

Ultra Low Flow Toilet Distribution: A planned event where hundreds of toilets are given away in one day, followed soon thereafter with an event where old toilets are handed in to be recycled. Events are typically held in a large parking lot.

Pros:

- No upfront costs to consumer for the toilet
- Short term effort; doesn't require the administrative presence of a permanent program
- Toilets can be purchased in bulk at less cost
- Significant water savings begin immediately
- Helps low income families get new toilet and save water
- Higher utilization rates than with other programs

Cons:

- Planning and marketing for the event require numerous staff and/or contractors (short term)
- If all toilets are not given away, storage is an issue
- Sponsor covers the entire cost of the toilet; not just part
- Usually have to have a system for collecting old toilets, usually two weeks after the event, to ensure that low flow toilets were replacing high flow
- Toilets may not all end up in the County; costly to verify location of installation

Water Utility Provider Programs

Water Utility programs are not within the direct jurisdiction of the County, but are mentioned because they can be incorporated into State standards for water utility systems that would aid the County in conservation. They can also be implemented

voluntarily by the utility companies with technical assistance and leadership provided by the County. Water Utility Provider programs often include the following:

- Water conservation promoting rate structures
- System audits
- Metering of all connections

These programs can be highly effective in conserving water. Where rates are high enough to provide an incentive to conserve (as in Santa Fe where the rates are very high – up to 15 times the Water Utility Authority rates), and where rate structures impose penalties, like surcharges, on certain water use patterns, significant water savings can be achieved.

In many communities, water conservation surcharges are used to fund water conservation programs, so as the surcharges decrease through decreased water use, there is less need for the conservation programs that were funded through the surcharge.

The problem with rate structure programs is that it's politically difficult to sell rate increases. According to the New Mexico Rural Water Association, many rural water systems are not charging their customers what they need to charge to maintain and repair old water infrastructure. Many are small, and are hesitant to increase rates to the degree necessary for leak repair and other system improvements.

Discussion points on cost effectiveness of water conservation programs

The concept of cost effectiveness is not an issue that lends itself to results that are either universal – the same programs in different communities produce very different cost benefits due to great variations in water rates. A low flow toilet in Santa Fe might save the owner $40 to over $200 per year in water charges, depending on what tier water rate the toilet use relates to (from $4/thousand gallons up to $29/thousand gallons). The same toilet with the Water Authority might save from $16 to $32 per year.

Then, the operative question is made tougher by the fact of the cost benefit to the end user is not the same as the question of cost benefit to the water provider, or in the case of the County – who is neither the end user nor the water provider. Bernalillo County

may choose to equate cost benefit to the relationship between what the taxpayer might pay through taxes and fees for a County Water Conservation Program and the benefits in cost reductions available to the end user (taxpayer).

Another significant difficulty in projecting cost benefits deal with the issue of the revenue loss by the water provider – which for public utilities can become a major conflict, such as is the case currently in Denver, where revenues are down but water availability is too. In Denver's case in particular, and all providers, the cost benefit most probably relates to not the current price of water, but rather to two other key issues – (1) How much does the water actually cost to provide vs. the income expected from that delivery, and (2) What is the cost of new water vs. the cost of existing sources. This is true for the Water Utility Authority since the existing aquifer water is free with the cost coming from the pumping and distribution system and administrative factors, while the San Juan Chama water itself is an expense, on top of the other factors. Many water conservation programs are approved based upon the understanding that it is cheaper to save and acre foot of water through water conservation than it is to acquire anew acre foot of water from a remote source.

APPENDIX I
ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

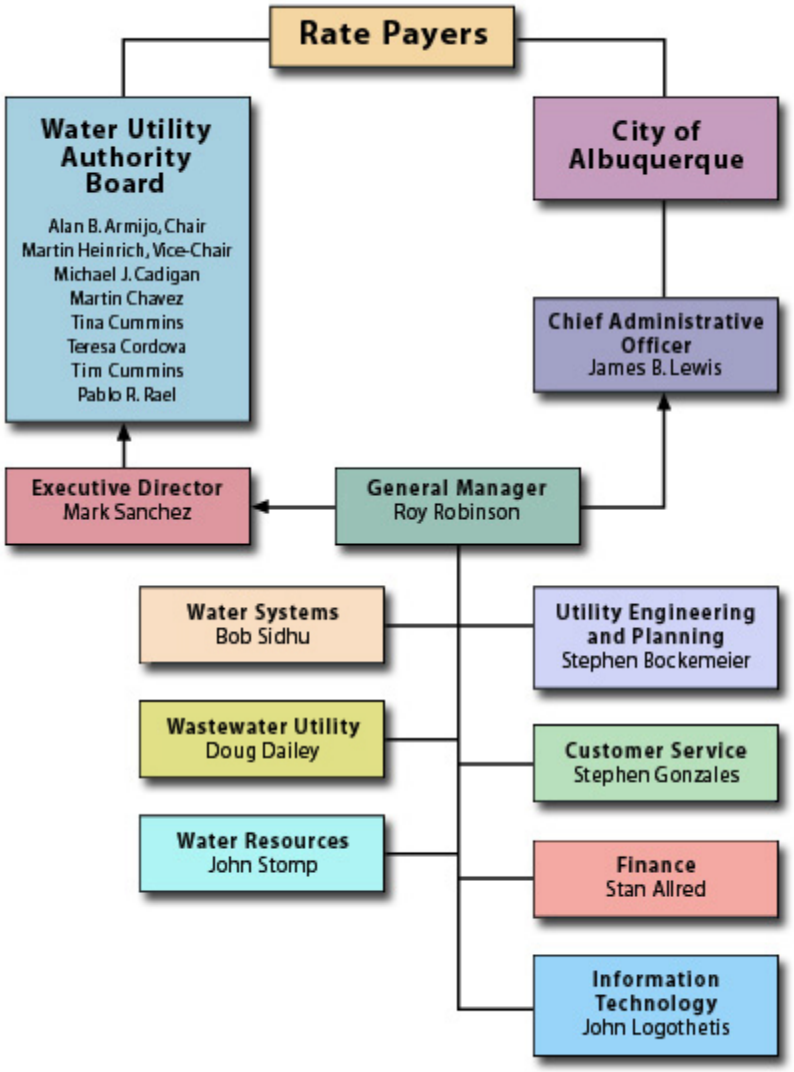
The Albuquerque Bernalillo County Water Utility Authority is a joint agency of the city of Albuquerque and the county of Bernalillo that administers the water and wastewater utility for all of Albuquerque and Bernalillo County. The Authority was created on June 21, 2003 by New Mexico Senate Bill 887 (laws 2003, chapter 437, codified as NMSA 1978, section 72-1-10).

To further communication and cooperation between the City and County on water and sewer service and develop a regional water utility, the New Mexico Legislature adopted legislation in 2003 creating the Albuquerque Bernalillo County Water Utility Authority (Authority) and transferred all functions, appropriations, monies, records, equipment and other real and personal property pertaining to the Water/Sewer System to the Authority. The Water Systems Division is responsible for providing water to some 475,000 Albuquerque and Bernalillo County residents.

The Authority is comprised of a board of three City Councilors, three County Commissioners and the Mayor of the City. Under the provisions of the legislation, the Water/Sewer System was transferred to the Authority on December 2003, after completion of an audit of the Water/Sewer System by New Mexico Public Regulation Commission.

To facilitate the transfer, the City, County and the Authority have entered into a joint powers agreement governing policy matters and a memorandum of understanding governing operational matters. Both of these documents provide a framework for the Authority to operate successfully and without interruption to the services provided to the community. While transfer of the Water/Sewer System to the Authority is not yet complete, it is expected that a phased transfer of operations will be completed by approximately December 31, 2006." (taken from ABCWUA website)

The City of Albuquerque offers several incentive programs to encourage water conservation. To date, well over 50,000 high flow toilets have been converted to low flow toilets, with customers receiving rebates up to $125 per toilet. Over 2,500 high water use landscapes representing almost 4,000,000 square-feet have been converted to xeriscapes, providing customers with landscape rebates up to $800 for residents and $5000 for businesses . Over 9,000 high water use washing machines have been changed out to low water use washers for $100 rebates per machine. Almost 9,000 residential, 23,000 multi-family, and over 1,000 commercial water customers have taken advantage of free water use audits and retrofits. The Water Utility Authority also offers rain water harvesting barrel rebate , hot water recirculation unit rebate , sprinkler timer rebate, and a dishwasher rebate .



The Water Utility Department and the Water Utility Authority

Relational Organization Chart

APPENDIX J
MANDATORY MEASURES REVIEWED
APPLICABLE LEGAL AND POLITICAL FACTORS
PUBLIC REGULATION COMMISSION FORM 710

Mandatory measures from conservation programs around the state and country were reviewed for applicability to Bernalillo County. The list of programs reviewed is in the methodology section of the Water Conservation Plan. Given the legal agreements in place between Bernalillo County and the City of Albuquerque for a joint water utility authority, the bulk of mandatory measures recommended come from ordinances in place for the City of Albuquerque. Chapter 6, Water Sewers and Streets, Article 1, contains many of the areas recommended for review, adaptation and adoption by the County, in order to create consistency across the entire County. Similar approaches are being used in conservation programs throughout the United States.

An important area to affect conservation lies in subdivision codes. Therefore, the subdivision code was compared between Sandoval County and Bernalillo County. The requirements for water conservation between the two codes is fairly similar. The design requirements for Sandoval County apply to new subdivisions that intend to go below the maximum annual requirements of 0.6 acre-feet per year. In addition to requiring a water conservation plan, there is a provision for deducting the amount of water collected in a cistern from the total required, which would serve as an incentive for conservation. Bernalillo County requires demonstration of a longer term supply than Sandoval County – seventy years versus fifty years, which is better for long-term sustainability. The requirements for Southern Sandoval County are slightly different – a subdivider must prove capacity to deliver 85 gallons per person per day, plus a landscaping requirement, with a maximum of 0.5 acre feet per household per year. Bernalillo County's requirement for the 0.6 acre feet per lot per year includes 1.84 acre feet per year for firefighting purposes.

Bernalillo County could consider amending its subdivision code to more actively promote water conservation, following on the Sandoval County Code, outlined above.

New requirements in the City of Albuquerque Building permit requirements are recommended for consistency in applying water conservation standards. Those requirements are in Chapter 44, Water Conservation, Section 4401. The Code requires as a condition of permit two of three alternatives for water-conserving devices, ranging from hot water re-circulating pump to a non-evaporative cooling system.

Mandatory measures cover many different areas. In the table below is a summary of the various areas that can be mandated to put requirements in place for conservation. The bulk of these mandatory measures are used in most of the conservation programs reviewed for the Bernalillo County Water Conservation Plan.

Mandatory Measures Reviewed

Prepared by Smart Use, LLC

MAJOR CONSERVATION ORDINANCES CURRENTLY IN PLACE

NOTE: Ordinances in place in the City of Albuquerque or in Bernalillo County

Name	Description	Target Group(s)	Comments
AUDIT AND RETROFIT			
ULFT retrofit	Ordinances in Santa Fe City and County mandating retrofit in commercial facilities by Jan 2005; City of Albuquerque requires retrofit for Large Users (average use = 50,000 gals/day)	Commercial	Accepted in Santa Fe because of the severe drought conditions affecting surface water supply
Leak detection and repair	Mandated for all users for indoor fixtures and irrigation systems; mandates to find and repair leaks is common in conservation ordinances	All	Enforcement may be difficult without billing system to trigger review for leaks
DEVICES AND EQUIPMENT			
Efficiency standards for water using appliances and irrigation devices	Ordinance requiring new users to meet standards above the current plumbing code for showerheads, icemakers, washing machines, etc. may require retrofit of existing devices	Can be targeted or apply to all users, depending on the devices	Standards need to be statewide or at least region wide to be practical
High efficiency washing machines	Mandate high efficiency washing machines in new developments or in any commercial facility with a laundry (Laundromat, hotel, hospital); some ordinances require retrofit for commercial customers; can also be part of retrofit on resale/remodel	New development, remodel, resale, commercial	New Energy Bill sets National standards but will not have impact for many years
Swimming pool and spa restrictions	Ordinance to limit evaporation; may prohibit any new pools unless covered; may require certain types of filtration/recirculating system	Usually applies to all pools and spas	Enforcement for new pools/spas can be done in concert with retailers

Efficient hot water systems	Normally set up as a rebate or incentive and not as an ordinance (mandate)	Commercial except for new development	Albuquerque sets it as potential fulfillment of conservation requirements for new development
Ice makers	For new purchases of ice makers; retrofit usually not required	Commercial	National energy bill sets standards but will not impact for several years
COMMERCIAL/INDUSTRIAL/INSTITUTIONAL			
Restaurants	Water on demand; required by most conservation ordinances, including City of Albuquerque	Food service establishments	Required by City of Albuquerque; accepted by restaurants and patrons
Linens upon request	Ordinance to allow change of linen only on change of guests or upon request of guests	Hotels/motels	Required by City of Albuquerque; accepted by businesses & customers
Car washes	Various regulations related to efficiency; may restrict charity car washes; car washes currently use 80-85 gals/car; may require separation, filtration or other system, plus reclamation	Car washes; charities that hold car washes	
Efficiency standards for new industrial & commercial processes	Usually ordinance requiring industry to use the most efficient process available	Commercial and industrial users	County is primarily residential
misters	Usually ordinance restricting misters	Can be targeted or apply to all users	
Outdoor evaporative coolers &	Setting standards on cooling systems to improve cycle ratios	Can be targeted or apply to all users	Need regional or state support
LANDSCAPE/ IRRIGATION			
Irrigation budgets	Regulate outdoor water use based on size of irrigation area; surcharge or penalty for exceeding water budget	Targeted to irrigation accounts (outdoor use only)	Would have to be run by private utilities; not applicable to wells

Large user irrigation audits	Irrigation system efficiency; watering schedules; check system components; in some communities an annual audit is mandated for irrigated areas over a certain size, for example, 10 acres.	Commercial/ industrial or inst sites with large landscaped areas	Advice only; popular program; very effective for large landscapes
Agricultural/ livestock audits	Audit of irrigation system efficiency for agricultural purposes;	Water used for agriculture or raising livestock	Already part of extension service; could be expanded
Weather sensors	Ordinance or rebate to increase usage of weather (rain) sensors to stop irrigation when not needed	Can be targeted or apply to all users	Public acceptance high
WATER UTILITY PROVIDER INITIATIVES			
Distribution system pressure regulation	Required by BMP's to improve efficiency of water use	Water utility providers	County can provide technical assistance or leadership in bringing the utilities together to explore feasible and desirable programs.
System water audit	Reduce non-revenue water though leak detection, repair and system maintenance	Water utility providers	
Metering of all sites (for utilities where all sites are *not* now metered)	May apply to new connections only or include retrofit of all connections	Water utility providers	
Water supplier billing records broken down by class	Assists with analysis and conservation planning	Water utility providers	
Innovative or conservation rate structures	Tiered rate structures that promote conservation; higher users pay higher unit cost; other innovative rate plans to encourage re-use, etc.	Water utility providers	
Wholesale supplier incentives	Technical assistance and incentives for conservation	Water utility providers	
Other Miscellaneous Ordinances			
Conservation Coordinator	Requirement for each water utility provider to have a water conservation coordinator	Water utility providers	

Greywater use	Wide range of ordinances and incentives to promote use of greywater for cooling, irrigation, and industrial applications	Can be targeted or apply to all users	State has a law governing use of greywater; issues may be complex; Bernalillo County is considering requiring a permit
Water waste restrictions & fines	Very common; imposes fines for run-off onto impervious surfaces; imposes watering times or days of the week	All water user groups	Important area for consistency for entire ABCWUA
Emergency or drought regulations	Tiered restrictions on water use based on drought stages	All water user groups	Not a high priority at this time as impacts of drought on ground water are not immediately apparent, and Bernalillo County primarily relies on ground water for supply
New Development			
New development landscape restrictions	Some restrict landscape to certain plant types; may restrict % of area in turf or require certain % to be xeric; may require trees or adherence to plant list; varied ordinances	New residential or commercial building	Restrictions on new development can be politically difficult and at a minimum will require a lot of consensus building as well as coordination with the City and other communities in the region.
Retrofit on resale or remodel	Requirements to retrofit high use fixtures with low flow upon resale or remodel; usually applies to toilets and sinks	Can be targeted or apply to all users; usually applies to residential	
New development building standards	In addition to landscape, requires certain efficiency standards for any new development	Home and commercial builders/developers	
“Zero footprint development”	New development must have a neutral or negative impact on water use; usually requires high efficiency building plus retrofit	Home and commercial builders/ developers	

Lessons Learned

Low Flow Ordinance: Require that all new purchases after a certain date be low flow or water efficient such as washing machines, dishwashers, ice machines

Pros:

- Ease of implementation – no accounting or tracking; applies to all utility customers and sites served with a well
- Low cost to the sponsor
- Perceived as fair – everyone participates to the same degree
- Higher participation rates results in much higher savings than voluntary programs
- Will probably be required in the future anyway for most devices, as we see the National Energy bill that was recently passed mandating lower water use for certain devices

Cons:

- Same as for other ordinances – mandates are not as popular as voluntary programs
- Low flow devices are typically more expensive. Dual flush toilets can add $500-600 to the cost of a new home
- Less consumer choice
- May involve monitoring and penalties

Ordinances targeted to certain industries – car wash, hotels, restaurants, landscape companies

Pros: See comments above under "Low Flow Ordinance"

- Can be very effective with industry buy-in
- Some ordinances are so widespread in other communities they might easily gain acceptance like "Drinking Water on Demand", washing hotel linens only upon request for stay over guests (City of Albuquerque does this already)

Cons: See comments above under “Low Flow Ordinance”

Must be done carefully to avoid perception that only certain industries are being asked to save water

Water waste ordinance or Watering Time Ordinance

Pros:

- Consistent with the ABCWUA - Piggyback on ABCWUA PR Campaign
- Can be promoted through a property tax bill insert
- Supported by the public
- Public helps report infractions

Cons:

- Requires enforcement team, penalties, and collection
- Ongoing effort

Retrofit on Resale

Pros:

- Assuming a toilet rebate is in place, retrofit on resale is not very expensive for the seller
- Buyers like the program – home has new fixtures

Cons:

- Unpopular with realtors because it adds another step, negotiating points and costs to an often already complicated transaction
- Requires enforcement through administrative channels with more paperwork required

Applicable Legal and Political Factors

a. The Public Regulation Commission was created in 1999, to replace the old Public Utilities Commission and State Corporation Commission. The role of the PRC is to oversee water and other small public utilities for adjudication, policy-making, compliance and consumer complaints. The information the PRC collects on an annual basis covers accounting information (debts, assets, distribution expansions), as well as aggregate water information. Water utilities issues, such as rate bases, rate cases (cost of service and revenue requirements), utility expenses, plant design, capacity and certificates of public convenience and necessity are covered by the Gas, Water and Wastewater Engineering Bureau See Appendix 7C for an example of the level of detail included in the water information.

b. The Albuquerque Bernalillo County Water Utility Authority is a joint agency of the City of Albuquerque and the County of Bernalillo that administers the water and wastewater utility for all of Albuquerque and Bernalillo County. The Authority was created on June 21, 2003 by New Mexico Senate Bill 887 (Laws 2003, Chapter 437, codified as NMSA 1978, Section 72-1-10).

c. Office of the State Engineer (OSE): The State Engineer regulates all new well permits, including single family, shared wells, and community water systems.

    i. The OSE allows a domestic well permit holder to use three acre feet per year. A domestic well permit currently costs $5. Once issued, there is no follow through to determine whether and where a well is drilled, and whether a well is closed down and done so correctly.

    ii. The OSE gives opinions on whether the water supply is adequate for forty years for new subdivisions, and counties have the ability to uphold the opinion, or deny the opinion and not allow a subdivision to go forward.

    iii. Well shares are allowed for domestic wells, with a maximum of four lots sharing one domestic well, subject to the same water limitations as outlined above.

d. Bernalillo County Code on Subdivisions lays out requirements for new developments to prove a water supply for seventy years. (add overview)

Public Regulatory Commission –
Water Form 710
Information collected about small public water utilities

FORM 1

NMPUC Rule 710 1 Effective 01/01/89

New Mexico Jurisdictional Information

Year Ending December 31, 20___

Water Company Name _____

Address:_____

Phone Number: _____

Person Completing Form: _____

Customer Class Residential Other Total

Number of Customers

Gallon Sales (Thousands)

Gross Revenues

Avg. Annual Gallon per Customer (1)

Avg. Annual Bill per Customer (2)

Avg. Monthly Bill per Customer (3)

Avg. Gross Revenue per Gal. sold (4)

Directions for the completion of (1), (2), (3), (4):

(1) Divide gallon sales by number of customers.

(2) Divide gross revenues by number of customers.

(3) Divide (2) by 12 months.

(4) Divide gross revenues by gallon sales.

Source - http://www.nmprc.state.nm.us/

APPENDIX K
VALUE DRIVER ANALYSIS

Value Driver Analysis

Weston Solutions, Inc. developed the following process to assist the County in deriving the most important values driving the water conservation program. Secondly, the process was used by the County to evaluate the recommendations in light of the values and the ease of implementation.

Difficulty of Implementation ←

Values ↓

	Hard	Medium	Easy
High	Address factors (6)	3	1
Medium	Address factors (7)	4	2
Low	Avoid	Avoid	Selective implementation (5)

Category	Measure	Score
V	Agricultural incentives - educational materials	1
V	Develop coordinated rebate program with ABCWUA for County residents (JPA)	
P	Develop new irrigation schedules for minimizing evapotranspiration (ET).	1
V	Develop rebate & incentive program for PIPE program participants	
M	Implement design regulations for conservation that apply to County facilities and new golf courses in unincorporated area.	1
V	Outdoor rebate program for residential (irrigation controllers, cisterns, grey water system) with ABCWUA	
V	Promote voluntary reporting of consumption data for metered domestic wells	
P	Publicize existing requirements for new development, as well as measures put in to promote conservation.	1
V	Publicize incentive program.	1
P	Set percent goal for individuals, households and businesses	
V	The County could conduct a toilet distribution with three distribution points, North, South and East.	1
V	Audits for resident in cooperation with ABCWUA	2
P	County develops conservation goals	2
V	Develop a series of training programs in conjunction with the USDA Natural Resources Conservation Service (NRCS) for County residents on how to conserve without spending a lot of money, climate-adapted landscaping, and optimal irrigation practices.	2
V	Develop educational materials on the various ground water basins (aquifers) in the County, drought, San Juan Chama impact and other items of interest to County residents.	2
V	Developing educational materials.	2
P	Engage with County leadership on Conservation plan, message and implementation.	2
M	Implement ABCWUA ordinances	2
V	Leak detection audits for small utilities' customers (provide audits at customer request)	
P	Publicize County-wide conservation goals.	2
P	Retrofit County Facilities (indoor fixtures)	2
P	The County should first measure a baseline of current water use for County facilities.	2
V	Toilet rebates program with ABCWUA.	2
V	upon inspection and thus verification of installation of stub-outs for a grey water system, the County would issue a check to the homebuilder	2
M	Review the ordinances in place that relate to water conservation for the ABCWUA, adapt them for use by the County, and go through the process of review for potential adoption.	3
V	Assist mobile home parks in submetering (education or incentives)	
M	Develop and enforce 80/20 landscaping requirement in new development	3
V	Develop Bernalillo County toilet rebate program (receipt + old toilet)	
V	Establishing a five-tier system for water smart homes, allowing commercial homebuilders to use it as a promotion, and then recognizing homebuilders for the number of water smart homes they sell.	3
V	For existing businesses, the County could put together a recognition program for businesses that take measures to save water.	3
M	Implement irrigation system standards for existing golf courses, athletic fields, golf courses and new development (excepting single family residential).	3

Category	Measure	Score
M	Implement water budgets for County and private golf courses, and to all County-owned parks and athletic fields.	3
M	Implementation of limitations on high water use landscaping.	3
V	Outdoor rebate program for new development - cistern	
V	Outdoor rebate program for new development - irrigation efficiency	
V	Outdoor rebate program for new development - rainwater harvesting system	
V	Outdoor rebate program for new development - water conserving site design	
V	Outdoor rebate program for residential (irrigation controllers, cisterns, grey water system) with ABCWUA	
V	Outdoor/indoor rebate program for new development - re-use and treat water (system)	
P	Publicize County Water Conservation plan.	3
P	Repair and maintenance to look at areas such as preventing leaks, replacing sprinkler heads and keeping grass slightly taller to minimize.	3
V	The County should design technical workshops with the assistance of the New Mexico Rural Water Association (NMRWA) and the Rural Community Assistance Corporation (RCAC) (one set geared for small utilities and the other for community water systems) to address the issues most relevant for the water system.	3
P	The County should develop relationships with the various systems and utilities to promote conservation and identify ways to reach residents that are non-ABCWUA utility customers.	3
P	The County should survey the small utilities and community water systems to describe existing conservation measures, training required to improve conservation, the accounting methods, level of metering for individual accounts, rates, and other charges. .	3
M	Time of day restriction	3
V	Toilet distribution program	3
M	Water waste ordinance	3
P	Work regionally for MRGRWP implementation of water conservation elements	
P	Work regionally for PRC conservation rates	3
V	Assist smaller utilities in meter testing and repair (education)	
V	Assist smaller utilities in determining amount of non-revenue water (education)	
P	Assist smaller utilities in grant-writing	4
V	Assist smaller utilities in tracking spikes and anomolies (education)	
V	Audits for residential Bernalillo County	4
P/M	Develop drought response plan	4
M	Promoting grey water systems through mandatory measures.	4
M	Require conservation measures for homes over a certain size, starting at 2,500 square feet.	4
M	Require more stringent conservation measures for homes over 3,000 square feet.	4
V	The County can subsidize metering for all (non-ABCWUA) utility customers that are not metered, either through new program funds, or by writing grants with the small systems for metering individual accounts.	4
P	Work with the individual systems to improve information gathering, water accounting and leak detection (for systems and for individual accounts).	4
P	Xeriscaping at demonstration sites as educational support.	4
V	Agricultural incentives - promote value-added crops - small business incubator	
M	Publicize new mandatory measures	6

Category	Measure	Score
M	Implementation of an ordinance requiring retrofit on resale or remodel – for the remodel portion, the requirement for low flow devices would be added to a permit required for plumbing retrofit.	7
M	Implementation of requirements for new development to have a zero footprint might be more politically difficult, and should probably be developed in conjunction with the ABCWUA and the Homebuilders Association.	7
V	Leak detection audits for small utilities	7
M	Requiring a meter for those who have four instances of water waste violations.	7