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**DATE:** June 14, 2011

**TO:** Board of County Commissioners

**FROM:** Karen Torres, Hydrogeologist *KT*

**THRU:** Patricio Guerrerortiz PE, Utility Director *Guerrerortiz*

**RE:** Consideration of a Resolution Adopting Key Recommendations from the Water Focus Group and Directing Utility Staff to Update the Conjunctive Management Plan for the Santa Fe Basin

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### **Background**

In 2009, the Board of County Commissioners adopted the "Santa Fe County Conjunctive Management Plan (CMP) for the Santa Fe Basin." The purpose of the CMP is to set guiding principles and planning objectives for the management of County's multiple sources of water supply (i.e. the Buckman Direct Diversion Project, City of Santa Fe supply, and groundwater wells). One of the primary objectives of the CMP is to maintain water system reliability during unanticipated events, which may include anything from regional drought to water system infrastructure failures. Subsequent to the development of the CMP, staff began pursuing the development of new groundwater production wells that would serve primarily as a back-up source to the BDD. The well proposals would be reviewed and scrutinized by the public and the New Mexico Office of the State Engineer (OSE).

At the November 10, 2009 meeting, the Board of County Commissioners received the "Staff Recommendation for Final Conjunctive Management Well Locations and Water Right Permitting". Commissioners then expressed an interest in seeking more public input on the proposed wells and directed staff to establish a "Water Focus Group" (WFG) to provide more detailed public input and conduct additional technical analyses, and public outreach on the proposed well locations. This report summarizes the efforts and recommendations of that group.

A key recommendation of the WFG, concurred in by County staff, is the need to revise the 2008 Conjunctive Management Plan to put a higher emphasis on aquifer storage and recharge. Aquifer storage and recharge has many advantages. First, such a program would store surface water supplies from the Rio Grande River which would then be available to provide backup supplies, thereby potentially reducing or eliminating use of native groundwater for this purpose. Second, aquifer storage and recharge has the potential to fully utilize permitted diversions from the Buckman Direct Diversion and store the water for future use, something which is not otherwise possible. Third, aquifer storage and recharge has the potential to recharge an aquifer that has been used for many years as a direct source of water. Therefore, aquifer storage and recharge is a refinement and improvement of the original plan to use groundwater as backup; the work of the WFG will be very useful in locating aquifer storage and recharge wells, although



further technical work will also be required to ensure that the aquifer can effectively store the water for later use.

### **Water Focus Group Process**

The Water Focus Group put together an aggressive work plan to review data used for regional and site specific analysis, developed a worst case drought scenario, selected well locations based on a ranking system and composed a well construction staging plan, surface and groundwater monitoring plan, OSE application language and a public outreach program. During the course of this project the immediate need for wells was reexamined and determined an extended time-line is the most practical way to proceed.

Several strategies for back-up supply were reviewed by the WFG which include: no action, City of Santa Fe supply, existing wells, new wells and a combination of City of Santa Fe water and new wells.

Twelve “suitability factors” (criteria) and weights, or importance of the factor, were established by the WFG. The final map, which is the total score for all the factors, was used to determine the most favorable well locations in the study area. Five well locations were selected by consensus to perform a site specific analysis to address predicted draw down to the aquifer and spring depletions by pumping these wells for 100 years based on a worst case and most likely back-up scenario. The modeled results show a substantial decrease in spring depletion and drawdown to the aquifer at the WFG-recommended well locations when compared to pumping from the wells where the water rights currently exist. This decrease is attributed to selection of proposed well locations that are an adequate distance from sensitive areas.

In addition to identification of proposed well locations and analysis of impacts, the focus group developed a conceptual groundwater and surface water monitoring plan. This plan proposes a monitoring boundary, location and number of monitoring wells, data collection methodology, survey of nearby domestic wells, definition and mitigation of measured excessive drawdown or impacts and reporting requirements. Language for the application for submission to the State Engineer was also drafted in consultation with the County’s water rights attorney which includes language that: 1) the wells proposed will be used only for back-up or minor maintenance use, 2) San Juan Chama Project Water will be used prior to groundwater pumping, 3) a groundwater and surface monitoring and mitigation plan will be implemented, and 4) wells will be staged and only in-basin water rights will be used. If an aquifer storage and recharge methodology is used, additional changes will be needed.

Upon completion of the proposed well locations, preliminary site specific analysis and permit language, consultation with the City of Santa Fe, Eldorado Area Water and Sanitation District along with three public meetings were held. Proposed well locations, model results and protection from impairment strategy were presented to seek input from the public and other stakeholders in the basin. Advertising the public meetings included posters, newspaper ads and targeted letters. The most effective form of advertisement was the letter sent out to homeowners as it generated the greatest turnout. Focus group members were present at all meetings adding credibility and defensibility to the project as they were able to clarify issues and answer questions as they arose.

Once public input was addressed, the WFG determined the original five conjunctive management well locations with the proposed protective language would be the recommendation





to the Board of County Commissioners for consideration. The proposed locations were as follows:

<b>Well Name</b>	<b>Location of Well</b>
Las Campanas Site	Off La Tierra Road in the Vicinity of the Fire Station
Tank Line Site	Located near the Rancho Viejo Booster Pump
Caja del Rio Site	Off Caja del Rio Road near the Animal Shelter
Fair Grounds Site	At the County Fairgrounds Facilities off Rodeo Road
Rail Trail Site	Along the Rail Trail at the end of 9 Mile Road

Upon completion of the above mentioned tasks, in August of 2010, the WFG concluded that it had sufficiently satisfied the charge it had been given by the BCC and completed its final draft recommendations.

The detailed Water Focus Group Report is attached as an appendix to this summary. Of particular importance are the recommended permit language which limits the wells to back-up supply only (Appendix F), monitoring and mitigation plans (Appendix D), methodology for well locations and public outreach.

### **Recommendations/Next Steps**

Staff recommends that the Board of County Commissioners approve a resolution that directs staff to accomplish the following tasks within 2 years:

- Address immediate back-up supply issues by negotiating with the City of Santa Fe to access at least 500 acre-feet of water for backup supply. This will allow time to assess the operational reliability of the BDD.
- Update the 2008 Conjunctive Management Plan for the Santa Fe Basin (CMP) to include recommendations and strategies for future applications formulated by the Water Focus Group which include legal protections, monitoring and mitigation, well location methodology and public outreach process. The plan should address the probability of water supply shortages and system outages and specific timing and phasing of needed back-up supply and production capabilities as water demands increase over time
- Appoint a Citizen Group by the BCC to assist when public concern or major policy issues arise or as needed.
- Assess the potential of aquifer storage and recovery (ASR) or other technologies to address management of water surpluses, water shortages, and water delivery system infrastructure failures. ASR investigations should include evaluating the extent to which the Santa Fe River could be used for groundwater recharge – thus also facilitating the community interest in a flowing river. As appropriate, develop initial plans for the implementation of ASR. Any ASR proposal or implementation should be carefully reviewed by a citizen group similar to the Water Focus Group and subject to an extensive public process.



- Direct staff to cooperate with the City of Santa Fe, La Cienega, La Cieneguilla, Agua Fria, Santa Fe Water Basin Water Association and Eldorado Area Water, Sanitation District and other stakeholders as identified to partner in regional back-up strategies, implementation of the Water Resources Agreement on a continual basis. Collaboration with these groups and the Office the State Engineer to propose Water Right Administration Guidelines for the Santa Fe Basin is a desired outcome.
- Assign a high priority to monitoring the La Cienega/ La Cieneguilla springs to be implemented as soon as a funding source is identified and direct staff to monitor on a continual basis.

We trust that the Board of County Commissioners would find the work of the Water Focus Group completed in accordance with the Board's initial charge.



**THE BOARD OF COUNTY COMMISSIONERS  
OF SANTA FE COUNTY**

**RESOLUTION No. 2011- \_\_\_\_\_**

**A RESOLUTION ADOPTING RECOMMENDATIONS OF THE WATER FOCUS  
GROUP AND DIRECTING UTILITY STAFF TO UPDATE THE CONJUNCTIVE  
MANAGEMENT PLAN FOR THE SANTA FE BASIN**

**WHEREAS**, groundwater supplies in the Santa Fe Basin are considered a reliable but not a renewable supply of water and for this reason the aquifer underlying the Santa Fe Basin should be thought of as a supplemental source of water, not a primary supply;

**WHEREAS**, surface water from the Rio Grande delivered by the Buckman Direct Diversion is a renewable water supply but may suffer from reduced flows due to prolonged drought of other catastrophic condition;

**WHEREAS**, on March 19<sup>th</sup> 2008, the Board of County Commissioners ("the Board") approved its Resolution No. 2008-51 which accepted the proposed draft of the Conjunctive Management Plan for the Santa Fe Basin ("CMP"), directed staff to solicit public comment and formally consult with the Pueblos of Tesuque, Pojoaque, Nambe, San Ildefonso and the City of Santa Fe, and directing formal presentation of the final plan to the Board;

**WHEREAS**, on January 13<sup>th</sup> 2009, the Board approved, by resolution, the final CMP;

**WHEREAS**, on November 10, 2009, the Board directed staff to establish a "Water Focus Group" to provide more detailed public input, conduct additional technical analyses, and propose permit language and an effective public outreach process;

**WHEREAS**, on January 6<sup>th</sup> 2011, the Buckman Direct Diversion project became operational and began delivering water to the citizens of Santa Fe County; and

**WHEREAS**, based on the enormous time and effort put forth by the WFG, key recommendations and strategies were formulated that are of value to Santa Fe County

**NOW, THEREFORE, BE IT RESOLVED** by the Board of County Commissioners, as follows:

1. As provided in the report of the WFG, County staff should enter into negotiations with the City of Santa Fe for back-up supply through the Sangre de Cristo Water System.
2. The CMP must be amended to include recommendations and strategies for future applications which include legal protections, monitoring and mitigation, well location methodology and the public outreach process. The CMP should also address the probability of water supply shortages and system outages and specific timing and phasing of needed back-up supply and production capabilities as water demands increase over time
3. A Citizen Group should be appointed to assist when major policy issues related to the CMP arise or as needed.



4. County staff shall immediately assess the potential of aquifer storage and recovery (ASR) or other technologies to address storage of the County's full allotment of water in the BDD project, management of water surpluses, water shortages, water delivery system infrastructure failures, and replenishment of the aquifer. ASR investigations must include evaluating the extent to which the Santa Fe River could be used for groundwater recharge – thus also facilitating the community interest in a flowing Santa Fe River. As appropriate, staff must develop initial plans for implementation of ASR. Any ASR proposal or implementation should be carefully reviewed by the citizen group described in paragraph 3 herein, and vetted through the appropriate public process.

5. Staff shall cooperate with the City of Santa Fe, La Cienega, La Cieneguilla, Agua Fria, Santa Fe Basin Water Association and Eldorado Area Water, Sanitation District and other stakeholders as identified to partner in regional back-up strategies. Collaboration with these entities and the Office the State Engineer to propose Water Right Administration Guidelines for the Santa Fe Basin is a desired outcome.

6. Staff shall regularly monitor the La Cienega/ La Cieneguilla springs as soon as a funding source is identified.

**PASSED, APPROVED AND ADOPTED** this \_\_\_\_\_ day of \_\_\_\_\_, 2011.

**THE BOARD OF COUNTY COMMISSIONERS  
OF SANTA FE COUNTY**

By: \_\_\_\_\_  
Virginia Vigil, Chair

**Approved as to Form:**

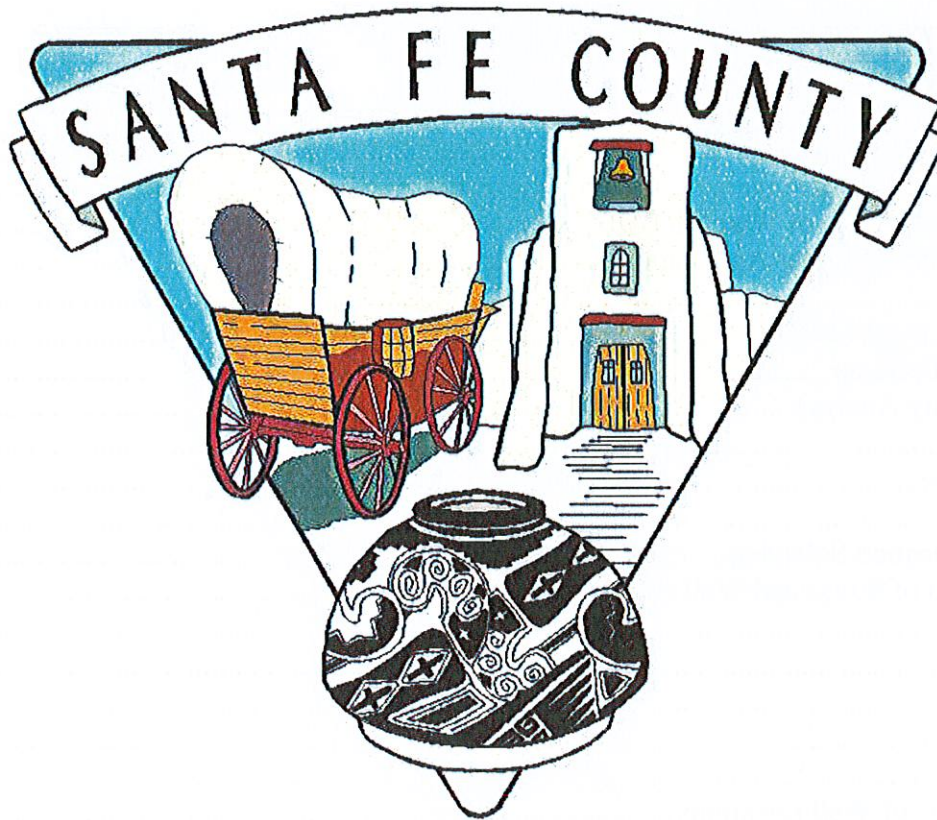
**ATTEST:**

  
\_\_\_\_\_  
Stephen C. Ross, County Attorney

\_\_\_\_\_  
Valerie Espinoza, County Clerk







**Recommendation to the Board of County Commissioners  
from the Water Focus Group Regarding Conjunctive  
Management Wells and Public Outreach**

**June 14, 2011**

**Santa Fe County Utilities Department**

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## Executive Summary

This report is the recommendation of a citizen group formed by the Board of County Commissioners to recommend a groundwater application to drill emergency supply wells in the Santa Fe County Metropolitan Water Utility service area. To this end the group put together an aggressive work plan to review data used for regional and site specific analysis, developed a worst case drought scenario, selected well locations based on a ranking system and composed a staging plan, surface and groundwater monitoring plan, application language and a public outreach program. During the course of this project the immediate need for wells was reexamined and determined an extended time-line is the most practical way to proceed.

This project is the implementation of the “Conjunctive Management Plan for the Santa Fe Basin” approved unanimously by the Board of County Commissioners on January 13<sup>th</sup>, 2009. This plan sets forth principles and planning objectives to diversify water supply and to formalize policy for the management and protection of the County's water resources. Several strategies for back-up supply were reviewed which include no action, City of Santa Fe supply, existing wells, new wells and an combination of City of Santa Fe water and new wells.

The original 10 suitability factors and weights, or importance of the factor, were reviewed by the focus group who recommended two additional factors and assigned new weights. The final map, which is the total score for all the factors, was used to determine the most favorable well locations in the study area. 5 well locations were selected by consensus to perform a site specific analysis to address predicted draw down to the aquifer and spring depletions by pumping these wells for 100 years based on a worst case and most likely back-up scenario. The modeled results show a substantial decrease in spring depletion and drawdown to the aquifer at the new well locations when compared to pumping from the wells where the water rights currently exist. This decrease is attributed to selection of proposed well locations that have a distance from sensitive areas and the 10 year moving average pumping regime.

In addition to identification of proposed well locations and analysis of impacts the focus group developed a conceptual groundwater and surface monitoring plan. These plans proposes a monitoring boundary, location and number of monitoring wells, data collection methodology, survey of nearby domestic wells, definition and mitigation of measured excessive drawdown or impacts and reporting requirements. Language for the application for submission to the State Engineer was also drafted in consultation with our water rights attorney which includes language that the wells proposed will be used only for back-up or minor maintenance use, San Juan Chama Project Water will be used prior to groundwater pumping, a groundwater and surface monitoring and mitigation plan will be implemented, wells will be staged and only in-basin water rights will be used.

Upon completion of the proposed well locations, preliminary site specific analysis and permit language consultation with the City of Santa Fe, Eldorado Area Water and Sanitation District along with three public meetings were held. Proposed well locations, model results and protection from impairment strategy were presented to seek input from the public and other stakeholders in the basin. To advertise for the public meetings three methods of advertisement were employed including posters, newspaper ad and targeted letters. The most

effective form of advertisement was the letter sent out to homeowners as it generated the greatest turnout. Focus group members were present at all meetings adding credibility and defensibility to project as they were able to clarify issues and answer questions as they arose.

Once public input was addressed the Focus Group determined the original 5 conjunctive management well locations with the proposed protective language, reviewed and presented by this group, would be recommendation to the Board of County Commissioners for consideration. The proposed locations are as follows:

<b>Well Name</b>	<b>Location of Well</b>
Las Campanas Site	Off La Tierra Road in the Vicinity of the Fire Station
Tank Line Site	Located near the Rancho Viejo Booster Pump
Caja del Rio Site	Off Caja del Rio Road near the Animal Shelter
Fair Grounds Site	At the County Fairgrounds Facilities off Rodeo Road
Rail Trail Site	Along the Rail Trail at the end of 9 Mile Road

The consensus of the Water Focus Group is that the original task of modification of the pending groundwater application and recommending appropriate public outreach has been completed. As such, the Water Focus Group offers the following comments and recommendation to the Board of County Commissioners for consideration:

- Sufficient Public Outreach was performed for this project
- To address immediate back-up supply issues use the 500 acre-feet of water from the Wheeling Agreement between the City of Santa and Santa Fe County initially. This will allow time to assess the duration and frequency of in –operation of the BDD.
- Continue to work with the City of Santa Fe to partner in regional back-up strategies and implementation of the Water Resources Agreement
- Include the proposed protective language and monitoring plans in any application to the State Engineer to insure implementation of the policy outlined in the Conjunctive Management Plan.
- Draft a Santa Fe County Utility Master Plan which addresses funding and staging of back-up wells and the acquisition of in-basin water rights.
- Seek grant funding for a pilot project to explore the aquifer potential for proposed well locations
- Discontinue City Bulk Water as back-up when wells are on-line to the extent possible.

Through the work of the Water Focus Group other alternatives and policy issues were identified. Due to the limited charter of this group the evaluation of additional topics would require additional public input and the

change or extension of the tasks requested from Board of County Commissioners. To this end, the Water Focus Group the following future action is recommended:

- Formalize this group as a recommending body by resolution which would require appointment of members by the BCC
- Update the Conjunctive Management Plan to reflect changes which have occurred since the original plan was drafted in coordination with the Water Focus Group and county staff
- Hold scoping meetings to look at alternatives to wells as back up supply such as hybrid or Aquifer Storage and Recovery wells
- Hold Public Meetings and have consultation with stakeholders in the basin
- Return to the BCC with an expanded recommendation for Board consideration

If the Board of County Commissioners feels the work of the Water Focus Group is completed and an additional scope is unnecessary at this time; the Water Focus Group respectfully offer their recommendation and thank the Board for allowing this process to occur.

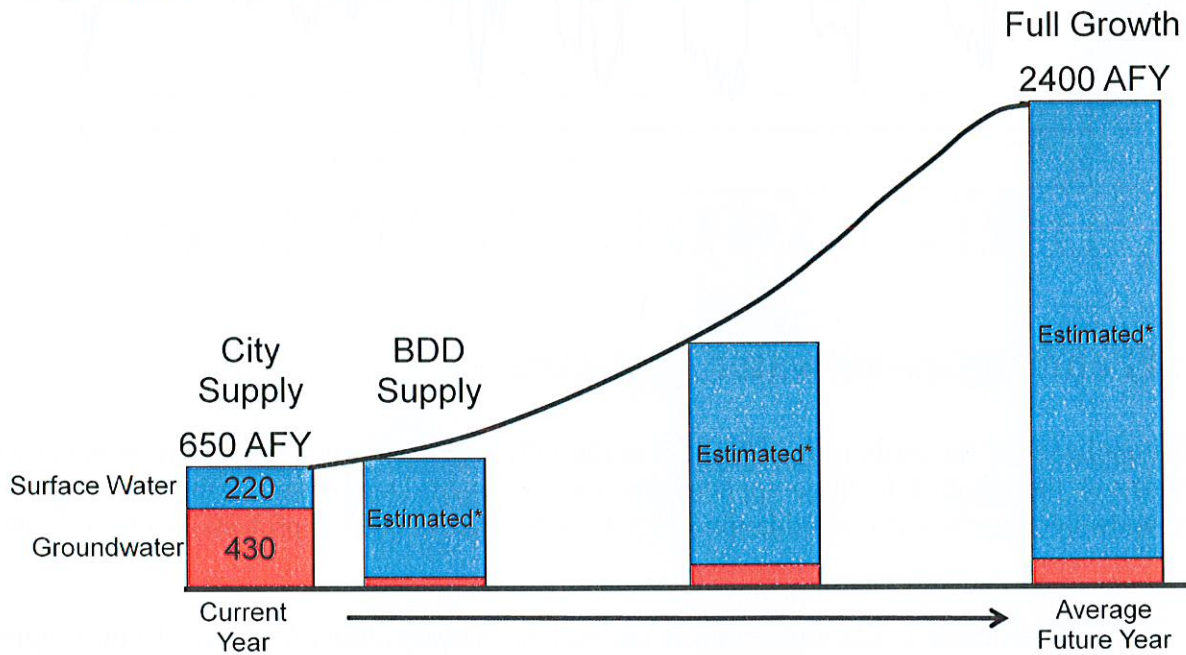
# Purpose

This report serves to document the work product of a citizen based recommending body named the Water Focus Group whose work part of the implementation of the Conjunctive Management Plan. Their charter from the Board of County Commissioners is to review work performed by county staff, offer language for the pending groundwater application and conducting an effective public outreach plan for this project.

## Need for an Alternate Source of Water to BDD

Santa Fe County and the City of Santa have collaborated on the successful completion of the Buckman Direct Diversion Project (BDD) Key benefits of the BDD is a significant reduction in current groundwater use (Figure 1), provides a surface water source for future growth and lessens the impact of groundwater pumping to the aquifer, springs and streams.

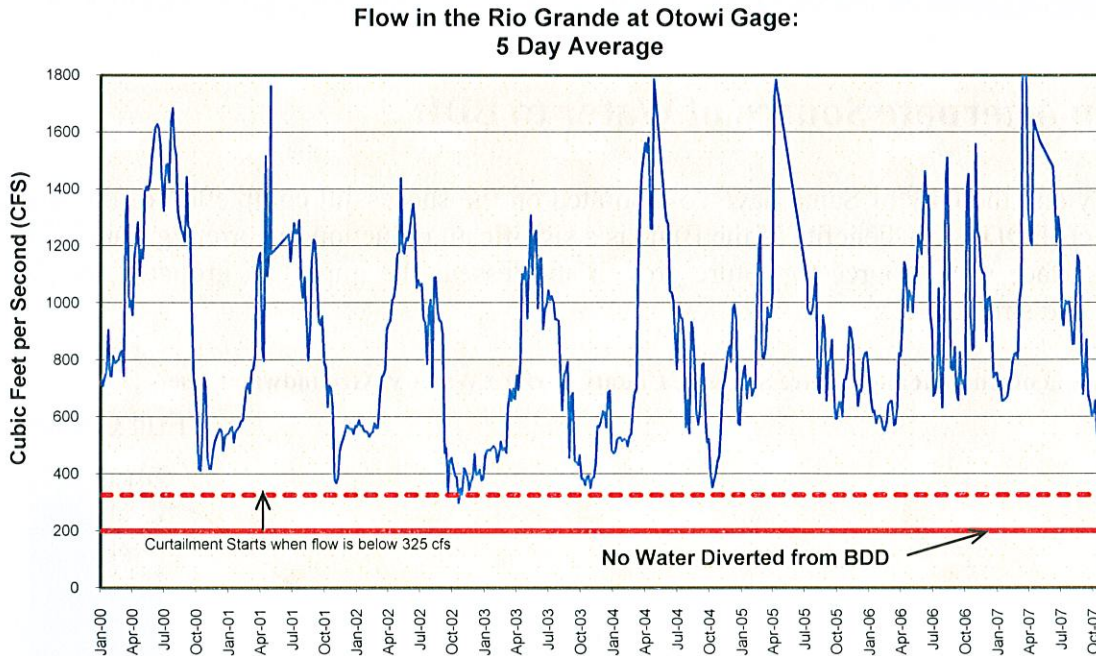
Figure 1: Comparison of Current and Future Santa Fe County Surface Water vs Groundwater Use



Although water from the BDD will provide additional supplies from a historically reliable source and will lessen the demand on local supplies, the county recognizes that surface flows on the Rio Grande can be variable. Figure 2 is a chart of the flow of water on the Rio Grande measured at Otowi Gage from January 2000 to October 2007 which shows great seasonal variability. Therefore, the County the proposed conjunctive wells as an alternate source of supply that may be used to diversify with the County's primary source of supply from the BDD in the event of a prolonged drought or prolonged in operation.



Figure 2: Seasonal Flow of the Rio Grande at Otowi Gage with Curtailment Levels Outlined by the BDD EIS



## History of Pending Groundwater Application

When the first applications for wells were submitted to the Office of the State Engineer in November of 2006 over 200 protests to the granting of these applications were received. Due to staff efforts in clarifying water policy for groundwater supply and consolidation of Protestants, the number of protests has been reduced to 5 parties.

At the Pre-Hearing Scheduling conference held at the end of January 2009, Santa Fe County agreed to a schedule for Santa Fe County to perform an analysis of each well location and prepare witness reports due by the end of May 2009. It was later determined that a more thorough analysis of potential well locations would be in the best interest of the County and additional time was deemed necessary and agreed to by all parties. The hearing regarding the granting of this application is currently in a stay until March 2011 but may be revised and re-filed as necessary.

## Water Focus Group

September 8<sup>th</sup> 2009 County staff presented a draft methodology for a well suitability analysis to determine the best locations for back-up wells. This map based analysis was formulated to address sensitive areas in the



region such as proximity to springs, aquifer decline and the availability of public water supply infrastructure. 5 public meetings were held to seek input on this analysis and to present proposed well locations.

To address public concerns regarding selection of well locations the Board of County Commissioners, on November 10, 2009, formed an appointed committee called the Water Focus Group to assist the County with modifying the pending groundwater application and conducting an effective public outreach plan for this project. This group consists of the following members:

Jose Varela Lopez: Cieneguilla and La Cienega Area  
John Miles Smith: Santa Fe Basin Water Association  
David Gold: Santa Fe Basin Water Association  
Rod Hall: Galisteo MDWCA  
Walter Wait: San Marcos Homeowners Association

The Water Focus Group met for the first time on January 14<sup>th</sup>, 2010 and developed the following work plan:

1. Notify Neighborhood Associations and other interested parties about the work of the focus group. Consider setting up a web page showing current activities of the focus group to enhance the transparency of this endeavor.
2. Revise the County's map-based sensitivity analysis and apply different weights to data sets. Produce a map with all factors combined with the 90<sup>th</sup> percentile areas highlighted.
3. a) Based on "Combined Factors" and "Domestic Wells" select tentative locations for seven well sites.  
1. b) Use Parcel Data to pinpoint the exact location for the seven tentative well sites.
4. Perform a site-specific analysis of each tentative location to determine:
  - a. impacts on neighboring domestic wells
  - b. impacts on streams and springs in study area
  - c. the maximum production that can be achieved while keeping impact acceptable.
5. Pursue Las Campanas' commitment and City Agreement to update the total volume required or projected in the Conjunctive Management Plan for back-up supply.
6. Establish the most effective combination to achieve total volume of water required for back-up needs. If necessary, consider additional locations,
7. Finalize well locations and determine a "Staging Plan" showing which wells should come on line early and which later.
8. Determine the general approach for monitoring the effect upon domestic wells, springs and streams.
9. Based on these well locations, establish a public participation and outreach plan including meeting locations and method of invitation/publicity.
10. Establish a mitigation plan as necessary if domestic wells, spring or stream show signs of impairment. It is proposed that the County assumes the responsibility for impairment mitigation unless the County is able to prove otherwise. The mitigation actions and a compensation method for each proven case should be explicitly defined.
11. Draft a conceptual groundwater and surface monitoring plan, which should include the number of monitoring wells needed as well as the frequency of measurements. The plan should also define how the data will be rolled-up and reported on a website accessible to the public. It may also be necessary to

define a specific “monitoring area” around each conjunctive well, and to determine the baseline water levels in each domestic well prior to beginning the monitoring plan.

12. Prepare the permit conditions for each conjunctive well. The permit conditions are the conditions that the County will request the OSE to include in the permit for each conjunctive well. These permit conditions will result from formalizing in tasks 5, 8, 10 and 11 above.
13. Draft the application to the OSE for the conjunctive wells in consultation with the county’s water rights attorney.
14. Get “agreement to proceed” from County Management on the legal application, permit conditions and public outreach plan.
15. Based on task 8, prepare the public presentations so that constructive feedback is obtained.
16. Make all necessary adjustments to the well locations, permit conditions and legal application based on the public input.
17. Submit first information packet to BCC as its public hearing of April 26<sup>th</sup>.
18. Submit second information packet to BCC at public hearing of May 10<sup>th</sup> if needed.
19. Submit application to the OSE, along with the proposals for maximum pumping volumes, monitoring plan, mitigation plan, and staging and permit conditions.
20. Based on OSE feedback, make all necessary adjustments to the submitted application. If the OSE denies the 10-year rolling average request, then major changes may be required.
21. Keep public informed of any significant changes made to the application and keep the BCC apprised of such changes.
22. At this point, there is general agreement between the County and the OSE on the contents and intent of the application and the work of the Focus Group is complete.

## **Conjunctive Management Plan**

On January 13<sup>th</sup>, 2009 the Board of County Commissioners unanimously approved the “Conjunctive Management Plan for the Santa Fe Basin” which set forth principles and planning objectives to guide the management of the County's water resources supplied from multiple sources. In addition, this document is intended to provide information to support the County's growth management strategy, and to guide other similar planning efforts.

The Conjunctive Management Plan is intended to cover the period from the date operation of the BDD begin until the county’s share of the project reaches its maximum capacity of 1,700 afy in 2030. It should be noted that Santa Fe County is obligated to provide potable back-up water to Las Campanas whenever the BDD is not in operation. The amount of water necessary for 100% back up is 2,352 acre-feet which is rounded up to 2,400 for this report. The County recognizes that it will need to develop other sources of supply in the long term future which is not described in this plan.

Implementation of this Plan is intended to provide the following major benefits to the Santa Fe Basin:

- Protection of Local Water Resources: By using surface water from the Rio Grande as the primary source of supply, use of local ground water resources will be minimized and water in the local aquifer will be preserved.
- Reliability of Supply: By establishing a back-up groundwater supply, water supplied by the County water utility will be made reliable even during those times when Rio Grande surface supplies may be inadequate, because of drought or other conditions affecting river flow or quality, including the potential impact of climate change.
- Acequia Preservation: This plan also affirms the County policy on the protection of acequia water rights.
- Optimization of Public Assets: By proposing a multi-year moving average for groundwater use, this Plan will optimize the rights already controlled by the county and dramatically reduce the groundwater rights needed by the County in the future.
- Benefits to Other Water Rights Holders: By shifting the predominant source of supply from local groundwater to Rio Grande surface supplies, any negative effects on area springs and surface water tributaries will be reduced.
- Environmental Benefits: In addition to reducing the impact upon springs and tributaries, the Conjunctive Management Plan contains a proposal to use excess capacity available at the BDD in order to release similar flows to the Santa Fe River. This proposal is aimed at increasing flows in the Santa Fe River but is seen as a short term solution.
- Regional Coordination: A critical foundation of this plan is regional cooperation and coordination with other stakeholders, including acequia associations, the City of Santa Fe and the Pueblos of Nambe, Pojoaque, San Ildefonso and Tesuque.

## Strategies for BDD Back-up

Though the Conjunctive Management Plan describes the need for back-up supply via wells other strategies for back-up supply have been discussed during the time the Water Focus Group met. These alternatives are discussed and are summarized below.

### No Action

By having no redundancy or secondary source of water for the County Utility customers, water service interruptions may occur in the event of prolonged BDD downtime. The consequent risk to public welfare is high, and no action would not be acceptable.

### City of Santa Fe Back-up

Currently, Santa Fe County has contracts with the City of Santa Fe by virtue of which the county receives water through the city network, and a 50% back-up in the event of a catastrophic event that would deprive both entities from Rio Grande water. The focus group saw the 500 acre-fee defined in the Wheeling Agreement as an

interim solution that will not meet the anticipated long term future demand of county customers. The Wheeling Agreement in the short term may defer the cost of a back-up supply system but if larger demands exist the cost will high as Santa Fe County will have to pay for the operation and maintenance of the BDD at minimum capacity (3 MGD) plus the fee for bulk water. Another down side to using bulk water supplied by the city is the loss of control in aquifer management as the county will have no say in source of water provided by the city.

### **Supply from Existing Wells**

Several existing wells drilled by Santa Fe County and developers were considered given the potential cost saving and knowledge about the production, construction and geology. However, these sites were not located in the high ranking areas and some had well production less than 250 gpm, a moderate volume for this aquifer. Though there may be some initial capital cost savings by using existing wells; their negative impacts to La Cienega springs, streams and existing wells this may result in higher transaction costs when seeking a permit from the Office of the State Engineer.

### **New Wells Only**

The Water Focus Group used the map-based sensitivity analysis to pick favorable well locations. Modeling was performed for each site to estimate drawdown and depletion on streams and springs. Some location adjustments were made to balance spring depletion and proximity to homes served by domestic wells. Five well locations were favored by the group, and these are discussed in more detail in section XXX. Since no well actually exists in any of these locations the actual well production is unknown and the anticipated costs of implementation are high. Due to extensive public outreach and consultation with water stakeholder groups in the basin the Office of the State Engineer permitting process is predicted to be shorter resulting in lower transaction (legal and mitigation) costs.

### **Combination of City Back-up and New Wells**

By utilizing City back-up initially Santa Fe County will have the opportunity to experience the reliability of BDD and establish more realistic back-up needs. There could be cost savings initially if little water is needed and there would also be sufficient time to drill test wells to verify production targets can be met, and seek appropriate funding. Once sufficient back-up wells are on-line the use of City bulk water for back-up can be discontinued and that water can be allocated to other users.

## **Map Based Sensitivity Analysis**

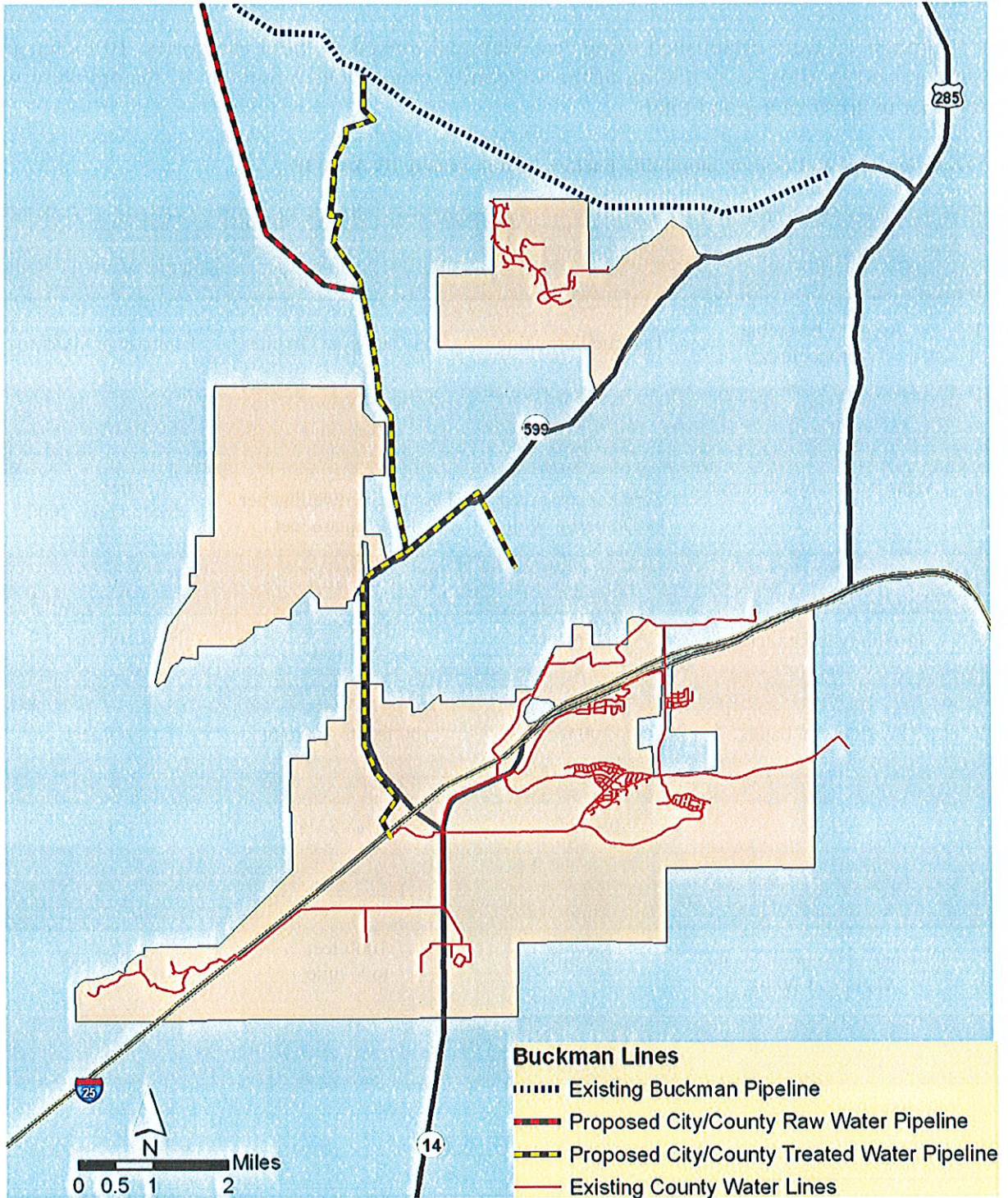
### ***Area of Study***

The area for this study is defined as the Santa Fe Metropolitan County Utility Service Area (Figure X) and is defined as the area of the county outside the City of Santa Fe limits where the Buckman Direct Diversion will serve Santa Fe County. It includes the Community College District, Las Campanas, the Northwest Sector, the Airport Development District, parts of La Cienega and up to the eastern county line. Generally speaking this area is very much the same as that inside the former 5-mile extraterritorial zone...



Figure 3: Map of Study Area

## Santa Fe County Utility Service Area



## Suitability Factors:

12 map based suitability factors were selected and given varying levels of importance in this analysis. Each factor was ranked for High, Moderate and Low Suitability and assigned a numeric value of 3, 2 and 1 respectively. An overview of these factors along with suitability criteria and weights is in Table 1. For a more comprehensive description of factors and data please refer to Appendix A. The Water Focus Group reviewed data sets used to create the suitability factors and recommended a weight for each factor.

Factors 1 through 12 were established using Arc Map and ranked in the 3 categories. 10 meter grids of these maps were created to allow easy adding of the suitability factors. Once ranked, all factors were weighted and added together to arrive at a grand total.

**Table 1: Overview of Well Location Suitability Factors used in Sensitivity Analysis**

Factor Number	Suitability Factors	Well Location Suitability			Weighting
		High Suitability	Moderate Suitability	Low Suitability	
Factor 1	Areas of favorable Hydrogeology	Tesuque Formation	Pre-Cambrian Granite	Espinaso or Galisteo	1
Factor 2	Proximity to Areas of known Arsenic Contamination	Less Than Maximum Contaminant level	Within Margin of Error for Maximum Contaminant Level	Greater than Maximum Contaminant Level	1.5
Factor 3	Areas Served by Domestic Wells	Zero homes served by Domestic Wells	Less than 1 dwelling per 1000 square feet	Greater than 1 dwelling per 1000 square feet	1.5
Factor 4	Feasibility of Pressure Zones	Pressure Zones 1 - 6	Pressure Zones 7 & 8	Pressure Zones 9 - 11	1
Factor 5	Proximity to Drainages	>500 feet	100 feet to 500 feet	<100 feet	1
Factor 6	Proximity to Springs	>1 mile	1 mile to ½ mile	< ½ mile	1.5
Factor 7	Proximity to Faults	>300 feet	100 feet to 300 feet	<100 feet	1
Factor 8	Areas of Aquifer Decline	>1/2 mile	500 feet to 1/2 mile	<500 feet	1
Factor 9	Slope	0 - 15 %	15% - 33%	> 33%	1
Factor 10	Distribution Potential	Within 2000 ft of BDD distribution line	Within 2000 ft of South Sector distribution line	>2000 feet from any distribution line	1
Factor 11	Distance to Community and Municipal Wells	>1/2 mile	1000 feet to ½ mile	<1000 feet	1.5
Factor 12 <sup>1</sup>	Known Contamination Sites	>1 mile	1 mile to ½ mile	< ½ mile	1.5

<sup>1</sup> Due to public concern a 2 mile radius was blacked out from factor 12 and represented as black circles on map



## Total of All Factors

All the factors and their assigned weights were added together and ranked by percentile. This sum was seen as the means to narrow the choice of areas that would be favorable for production wells. The resulting map (Figure 4) was considered by the group the final ranking of potential areas where wells can be developed while considering the least impact to the community and the environment. At the request of the Water Focus Group, Office of the State Engineer well data and residential structures served by domestic wells was overlain on the map in to have a better sense of the location of domestic wells. The most suitable areas are in blue.

Figure 4: Sum of All Weighted Factors

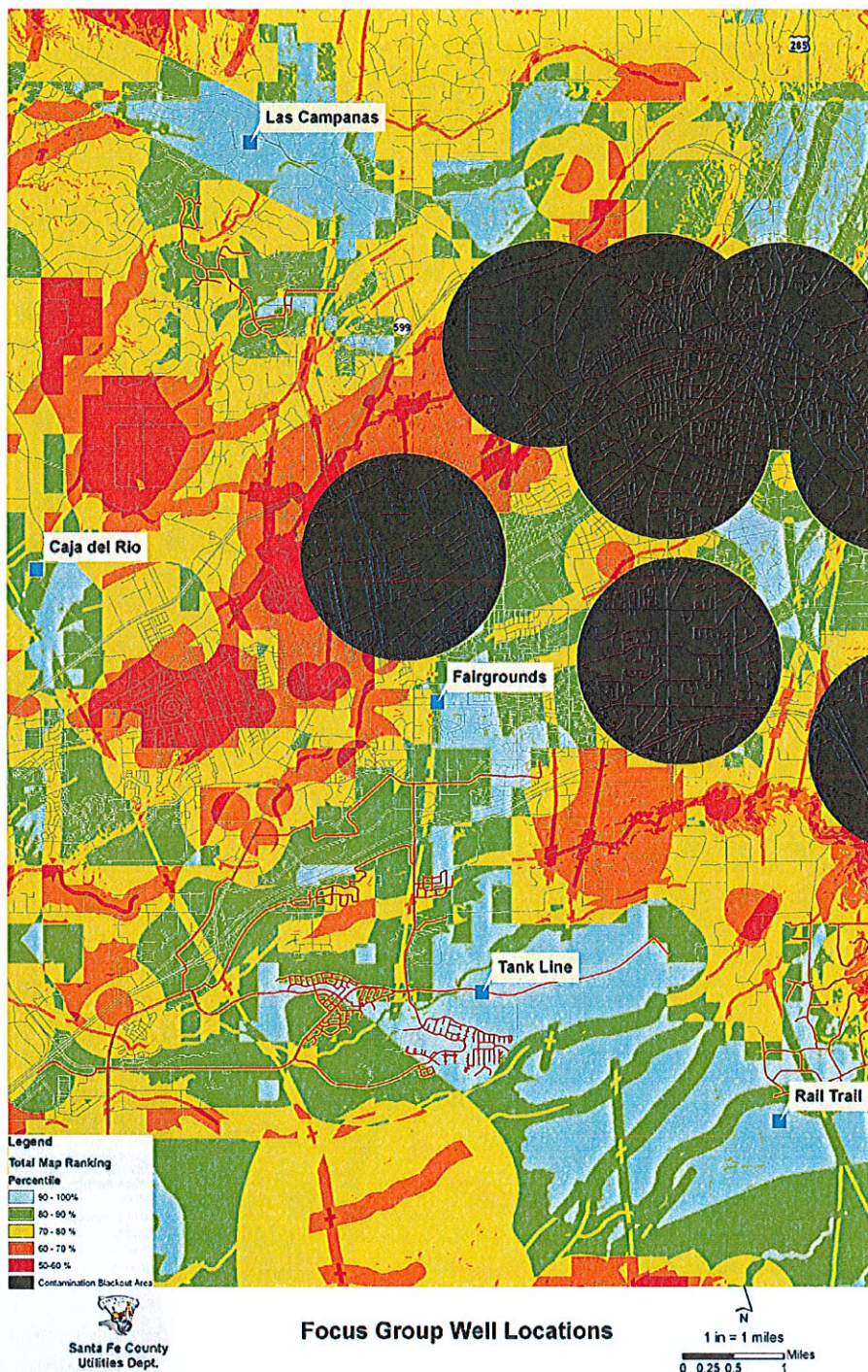




# Preliminary Well Location Selection

The Water Focus Group selected areas ranked in the 90<sup>th</sup> percentile (blue areas in Figure 4) of the final ranking map (Figure 4). The goal was to have the well locations spread around the project area so the ground water pumping impacts could be evenly distributed. The 5 preliminary well locations, labeled in figure 5 below, were used for the site specific analysis described later in this report.

Figure 5: Preliminary Well Locations

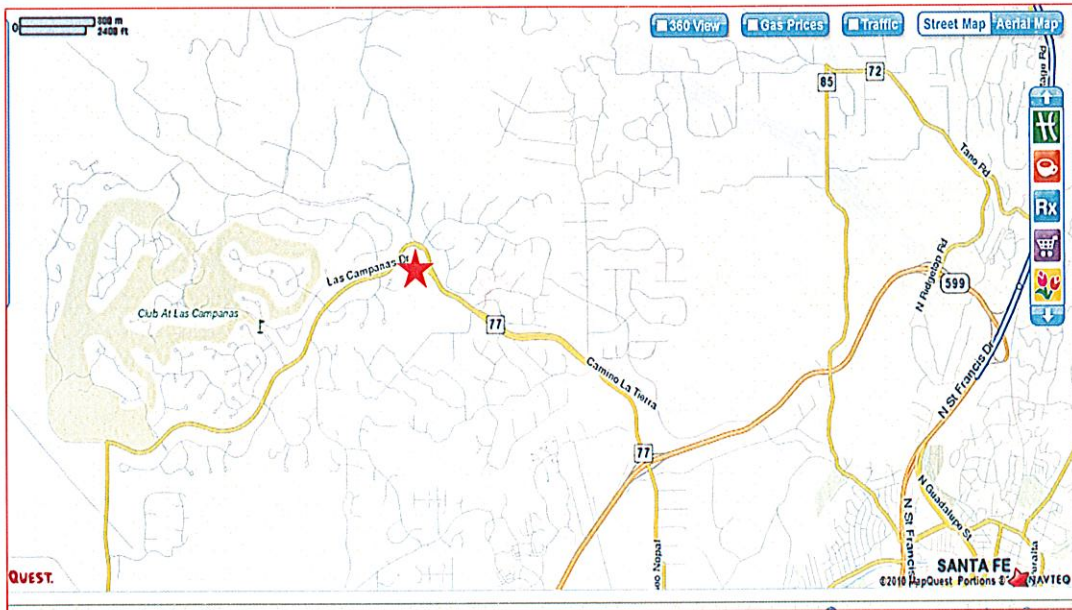




# Location Description of Suggested Well Sites

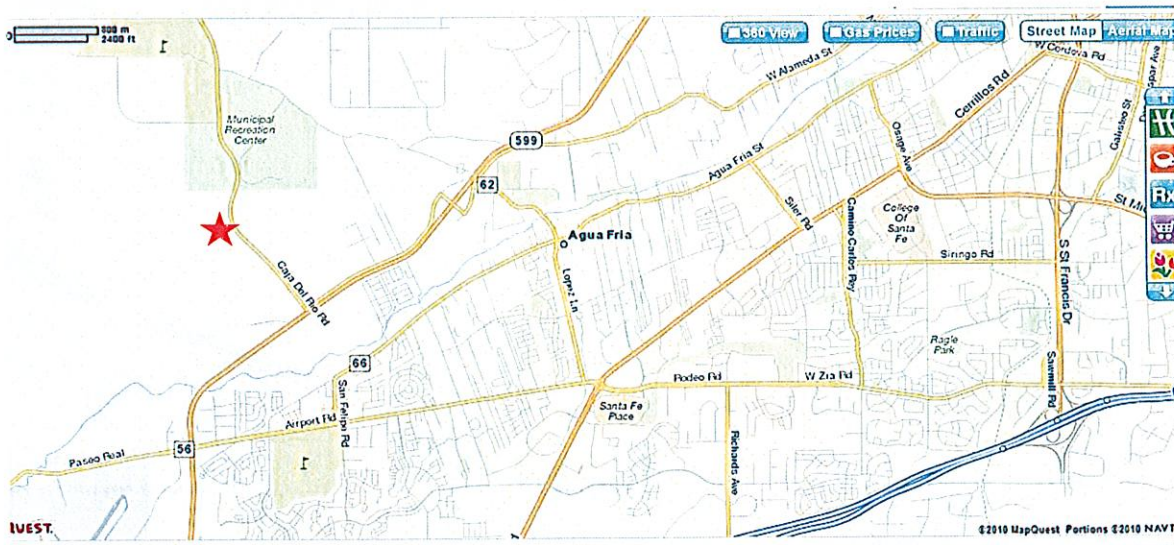
## *Las Campanas Site*

The proposed Las Campanas Well Site is located near the La Tierra Fire Station and can serve as back-up supply to the county's northwest sector and Las Campanas. As most of the homes in this area are served by a regional water system and is in close proximity to existing infrastructure. This location meets the criteria for high suitability is favored for one of the early locations.



## *Caja del Rio Site*

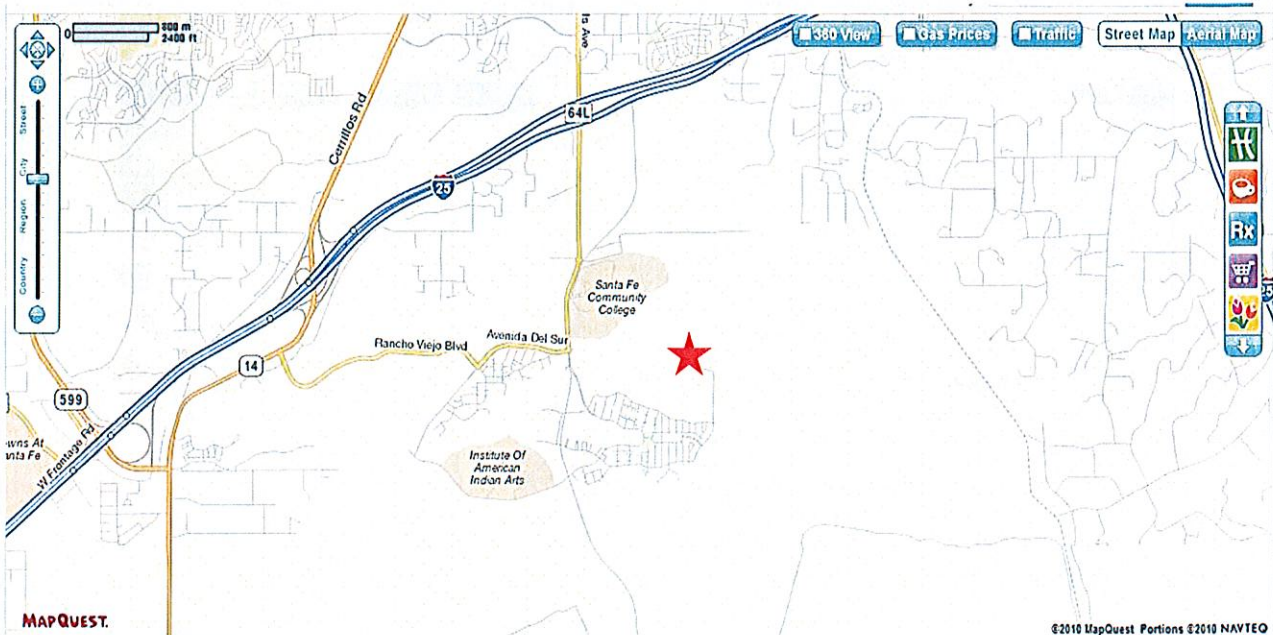
This proposed site is located on Caja del Rio Road near the Humane Society Facility. This well location can serve future growth areas near the Airport Development District and existing government structures. Due to its proximity to aquifers of known elevated arsenic, water quality may become an issue against this site.





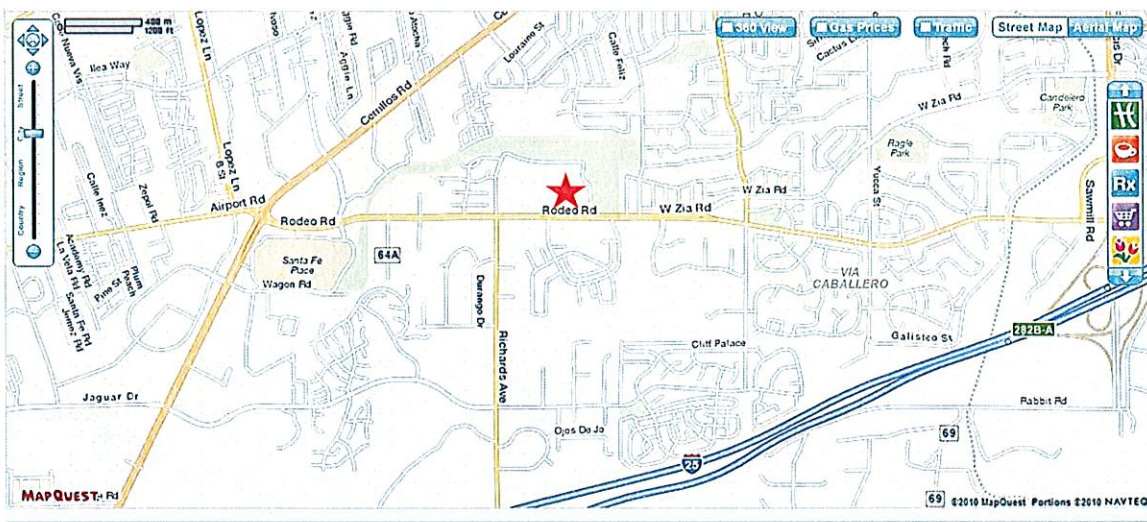
## Tank Line Site

This location is near the booster pump which serves the County's 1.5 million gallon Rancho Viejo tank. This location can serve the Community College District and would be near existing infrastructure. This site is favored as one of the initial well locations, which is discussed further in the well staging plan.



## Fairgrounds Site

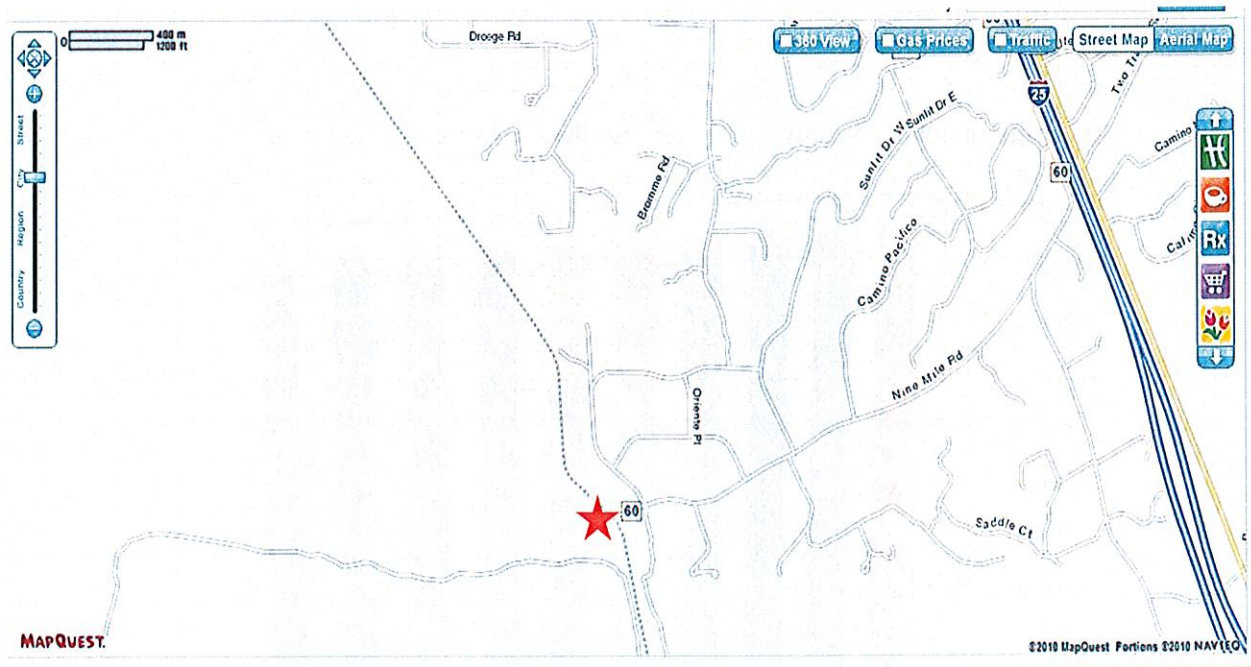
This location is on existing County property which currently houses the SFC Extension office and Fairground facilities. A well at this location would require a significant extension of water lines to reach the county distribution network and this would drive the cost up. Furthermore design of well in this location would also require consideration of existing geological structures that are likely to exist here.





## Rail Trail Site

This site is located along the Rail Trail near 9 Mile Road and is proposed as a later stage well location, as there is no existing infrastructure in the area. This well site was selected to avoid existing homes currently served by domestic wells but the Tesuque aquifer underlying this area is only about 500 feet thick, and hitting a production target of around 300 gpm may be difficult.



## Site Specific Analysis of Well Locations

### 100 Year Impact Analysis

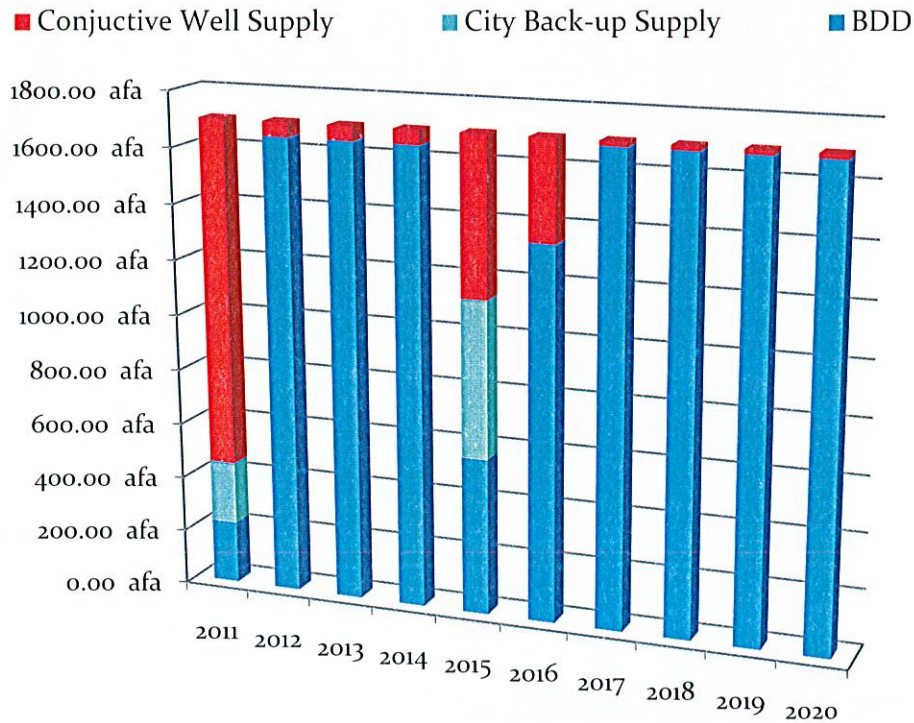
Following the preliminary selection of these well locations were selected a 100 year simulation Was performed to predict the effects on the aquifer and streams and springs was performed using the OSE Administrative MODFLOW Model and the OSE Theis Solver. Since the proposed wells would not be production wells, which pump all year round, several scenarios of future use were proposed by the group. Two scenarios were developed based on a 10-year “rolling” or moving average concept discussed in the Conjunctive Management Plan plus the Worst Case and Most Likely Scenario respectively.

### Worst Case Scenario

Based on historic flows on the Rio Grande and the firm yield San Juan Chama Project Water the biggest threat to the county’s water supply would be failure of the BDD infrastructure, rather than drought. This scenario assumes the BDD will be rendered inoperable for up to 8 months followed by a 5 year drought event. (See Appendix B for a more detailed explanation of this scenario.) It should be noted the probability of such a combination of events an event is very low. This water demand for this scenario is 2,382 acre for a ten year time

frame. This scenario will pump at different amounts each year and is demonstrated in Figure 6 in red. This 10 year water usage is repeated 10 times to simulate pumping for 100 years.

**Figure 6: Worst Case Scenario Pumping 2,382 acre-feet every 10 years for 100 years**

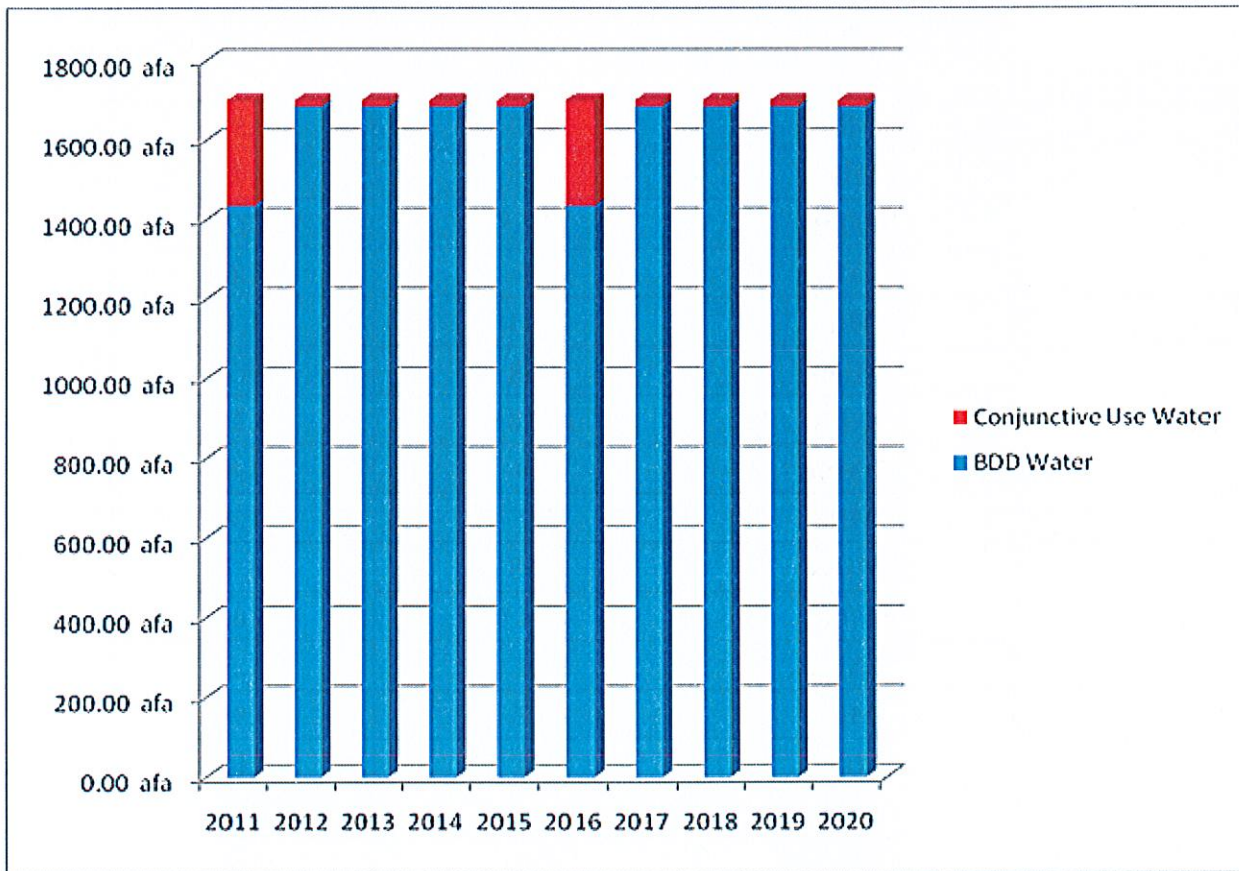


### Most Likely Scenario

The most likely scenario is a 1 year curtailment or drought event once every 5 years plus an average BDD downtime of 1 month per year. For the remaining years maintenance pumping of 15 acre-feet per year, based on the same assumptions as the Worst Case Scenario. (Appendix B) To be conservative a peak demand month was chosen to mimic the water demand for the 1 month of downtime per year. The total demand of water for a 10 year period is 889 acre-feet. The 10 year usage is repeated 10 times to simulate 100 years of pumping. This scenario will pump at different amounts each year and is demonstrated in Figure 6 in red. As this scenario has a lower water demand than the worst case scenario the predicted impacts to streams and springs will, by this virtue, be less.



Figure 7: Most Likely Scenario Pumping 889 acre-feet every 10 years for 100 years



## Drawdown to Aquifer

An analysis was performed using the OSE Theis Model to estimate drawdown to the aquifer due to pumping of the 5 focus group wells for 100 years utilizing the Worst Case and Most Likely pumping scenarios.

### *Estimates of Drawdown*

With all wells pumping simultaneously, the drawdown is not the same in all directions. As wells interfere with each other, the drawdown varies slightly at each well location. Table 2 shows the predicted drawdown at distances of 1000 feet, ½ mile and 1 mile from each pumping well.

**Table 2: Predicted Drawdown at Each Site**

<b>Well Name</b>	<b>Distance from Well</b>	<b>Worst Case</b>	<b>Most Likely</b>
Las Campanas Site	1000 ft	12.06*	2.9*
	1/2 Mile	5.2	1.4
	1 Mile	3.13	0.84
	2 Miles	1.55	0.42
Rail Trail Site	1000 ft	12.6*	3.07*
	1/2 Mile	5.9	1.6
	1 Mile	4.04	1.1
	2 Miles	2.68	0.7
Tank Line Site	1000 ft	13.38*	3.2*
	1/2 Mile	6.8	1.8
	1 Mile	5.2	1.4
	2 Miles	2.68	0.7
Caja del Rio Site	1000 ft	12.4*	3.01
	1/2 Mile	5.4	1.5
	1 Mile	3.7	0.99
	2 Miles	2.4	0.65
Fair Grounds Site	1000 ft	13.03	3.2
	1/2 Mile	6.1	1.7
	1 Mile	4.08	1.1
	2 Miles	2.54	0.68
	* Reflects feet of drawdown at highest rate during the last 10 years (91 yr - 100 yr) time frame. Average T. Value		

## ***Analysis of Drawdown***

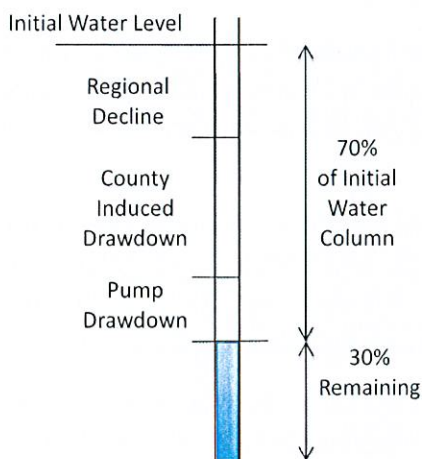
### **Excessive Drawdown Criteria**

To estimate if the proposed pumping has the potential impact nearby wells the Office of the State Engineer Hydrology Bureau Report 06-1“Guidelines for the Assessment of Drawdown Estimates for Water Right Application Processing” was used. An important trigger point outlined by the OSE is when the initial water column is reduced by 70%. This takes into account regional aquifer decline, the long term drawdown induced by the subject well pumping and the instantaneous drawdown which occurs when the well is turned on,



commonly referred to as borehole storage. The sum of the multiple sources for aquifer drawdown is illustrated in Figure 8.

**Figure 8: 70% of Drawdown to a Well from Various Sources**



Impairment of a well is not defined by the state of the well going dry but the lowering of the aquifer such that insufficient water column remains for the well to continue functioning. To be able to determine the actual impact of the proposed wells to the aquifer, a baseline scenario must be established.

## Impairment Prevention

Upon implementation of the proposed wells, several measures will be taken to prevent the impairment of existing wells.

- Low pumping rates will minimize draw down
- Monthly monitoring well measurement
- Project (calculate) drawdown into the future

In addition, we anticipate that current users (domestic wells, springs and streams) will see a lesser impact on their supply because of following facts:

- An overall decrease in groundwater usage throughout the County Service Area
- Well permit conditions will only allow use of backup wells only in the event of extraordinary conditions. Description of these proposed conditions are in Appendix F.
- Well locations were selected to minimize impact to existing surface and groundwater users
- Monitoring program will be in place to regularly evaluate impact and take corrective actions
- Wells will be operated to minimize impacts to nearby wells, streams and springs by structuring their operation schedules accordingly

## ***Monitoring Plans***

The Water Focus Group spent a great deal of time developing both surface and groundwater monitoring plans to protect existing users in the basin. It is very difficult to have a site specific monitoring plan prior to a well actually being drilled so conceptual monitoring plans that address the major elements are proposed by the group. Detailed language for surface and groundwater monitoring can be found in Appendix D.

### **Conceptual Groundwater Monitoring**

The number and locations of groundwater monitoring wells will be chosen so that actual drawdown to sensitive areas and wells of other ownership, within a 2 mile radius monitoring area, can be assessed. Data will be collected on a monthly basis and compiled in an Annual Report with posting on the County webpage for public review.

Due to low drawdown shown by modeled scenarios, it is anticipated only 1 monitoring well will be necessary for each County Well location. However, if the actual drawdown associated with a County Well exceeds the drawdown modeled in the Worst Case Scenario (Appendix B) by 10%, then the County will determine an appropriate method to determine the basis, and potential effects of the unanticipated drawdown.

In the event of excessive drawdown mitigation plan, which will define actions and associated costs, must be submitted to the Board of County Commissioners for approval within one year from the Annual Report containing the projection of excessive drawdown or depletion.

### **Conceptual Surface Water Monitoring**

To establish a baseline and to investigate patterns of changing conditions in the Santa Fe Basin and establish a baseline of surface water flow the following monitoring is proposed. It should be noted this monitoring is not proposed to measure surface water depletions due to the proposed pumping of County wells but to look at overall discharge to the La Cienega / La Cieneguilla spring areas and Santa Fe River flows at La Bajada. The plan will attempt to better understand the impacts of regional groundwater pumping in order to avoid impairment of area streams and springs that serve senior water right owners. In order to implement this Plan the County shall perform the following functions:

End product of both monitoring plans will be a biannual report which will be published on the county webpage. This report will synthesize this data, attempt to analysis patterns and make recommendations for future surface water monitoring.

## ***Conclusion***

The predicted draw downs caused by the pumping of all 5 proposed well locations for 100 year, for both scenarios, demonstrate a range of drawdown from less than 1 foot to 13.38 feet. It is the consensus of the group that the predicted drawdown is within an acceptable range for these proposed locations with the caveat the previously mentioned protection measures are taken.



## Depletion to Springs and Streams

The OSE Core modification of the McAda-Wasiolek Superposition Model has been used to quantify 100 year depletions to streams and springs in the Santa Fe Basin. The same scenarios used to predict drawdown were used as inputs into this model. The results of the worst case and most likely scenario were compared to the depletion predicted to occur from the full use of water rights to be transferred or “move-from water rights”. This was done to compare if the calculated depletions in each scenario will be greater or reduced from the original water right. The results of this modeling effort are as follows:

<b>100 Year Depletions</b>			
<b>Streams</b>	<b>Worst Case Scenario (in acre-feet per annum)</b>	<b>Most Likely Scenario (in acre-feet per annum)</b>	<b>Move-From Water Rights (in acre-feet per annum)</b>
Rio Grande	0.00 afa	0.00 afa	0.00 afa
Pojoaque	0.34 afa	0.06 afa	0.14 afa
Tesuque	2.40 afa	0.40 afa	0.83 afa
<b>Stream Total</b>	<b>2.74 afa</b>	<b>0.46 afa</b>	<b>0.97 afa</b>
<b>Springs</b>			
1. Arroyo Hondo	15.23 afa	2.56 afa	52.31 afa
2. La Cieneguilla	0.74 afa	0.12 afa	2.58 afa
3. La Cienega/Arroyo Hondo	4.69 afa	0.79 afa	15.31 afa
4. La Cienega Flume	16.36 afa	2.75 afa	52.55 afa
5. El Guicu	0.65 afa	0.11 afa	2.11 afa
6. Santa Fe River	0.13 afa	0.02 afa	0.37 afa
<b>Spring Total</b>	<b>37.80 afa</b>	<b>6.36 afa</b>	<b>125.23 afa</b>

### *Analysis of Spring Depletion*

#### **Distribution of Spring Depletion**

As the 5 wells are at different distances from La Cienega and La Cieneguilla Springs the depletion associated with the pumping from each well is unique. The following is a breakout of the estimated percentage each well

would contribute to the total depletions to the springs based on the worst case and most likely scenarios respectively:

- Las Campanas = 8%
- Tank Line = 19%
- Rail Trail = 10%
- Fairgrounds = 21%
- Caja del Rio = 48%

The least significant effect would be caused by the proposed Las Campanas well, while the most significant impact would be caused by a well at Caja del Rio

### ***Conclusions of Spring and Stream Analysis***

The worst case scenario is predicted to increase impacts on the Rio Tesuque and Rio Pojoaque. Through the Aamodt Settlement Agreement, Santa Fe County may impact these streams through groundwater pumping, if these impacts are mitigated through a wet water delivery mechanism. Due to the small impacts predicted, a wet water delivery system is very feasible to offset the modeled stream depletion. Since each proposed well location has unique estimated depletion to springs, a well staging plan, discussed in more detail later in this report, is proposed by the Water Focus Group. A staging plan will insure the pumping of groundwater will not be concentrated in one area. With the appropriate mechanism to offset impacts to streams and through the implementation of a well staging plan, it was the consensus of the group that the predicted impacts are within an acceptable range for the proposed well locations

### **Fiscal Staging of Wells**

An opinion of cost for drilling and equipping a pilot well and a production well was prepared by CH2M Hill. Estimated do not include the cost of land acquisition or storage tanks and total 2 million dollars per well. The summary of these cost are as follows:

**Table 3: Summary of Well Cost:**

Item No.	Description	Tank Line Site	Las Campanas	Caja del Rio	Rodeo Grounds	Rail Trail
1	Drill and Develop Well	\$1,020,000	\$1,020,000	\$1,020,000	\$1,020,000	\$1,020,000
2	Purchase existing well	\$0	\$0	\$0	\$0	\$0
3	Equip well with Pump and Appurtenances	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
4	Well house/CL <sub>2</sub> equipment enclosure	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
5	Electrical Power Service	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
6	50,000 gallon storage/suction tank	\$0	\$0	\$0	\$0	\$0
7	500-gpm booster pump station	\$0	\$0	\$0	\$0	\$0
8	6-inch Ductile Iron conveyance Pipeline	\$940	\$470	\$12,690	\$44,650	\$15,510

Item No.	Description	Tank Line Site	Las Campanas	Caja del Rio	Rodeo Grounds	Rail Trail
9	Valves and appurtenances	\$47	\$24	\$635	\$2,233	\$776
10	Bore & Jack Road - Crossing	\$0	\$0	\$70,000	\$0	\$0
11	Drill Test / Monitoring Well	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000
12			\$0	\$0	\$0	\$0
Subtotal Estimated Cost		\$1,536,000	\$1,535,500	\$1,618,300	\$1,581,900	\$1,551,300
Contingency @ 20%		\$307,200	\$307,100	\$323,660	\$316,380	\$310,260
Subtotal Estimated Costs including contingency		\$1,843,200	\$1,842,600	\$1,942,000	\$1,898,300	\$1,861,600
NMGRT @ 6.5% for Santa Fe County		\$119,808	\$119,769	\$126,230	\$123,390	\$121,004
<b>Total Estimated Costs including contingency and NMGRT</b>		<b>\$1,963,000</b>	<b>\$1,962,400</b>	<b>\$2,068,200</b>	<b>\$2,021,700</b>	<b>\$1,982,600</b>

As the cost of individual wells were similar, a comparison of cost was not useful in this analysis.

### ***Staging Strategy***

The Water Focus Group concluded that the appropriate strategy would be to have two wells go on-line simultaneously, so that the pumping of groundwater was not concentrated in one specific area. The suggested staging plan was worked out taking into account the need for of the back-up well execution to be in-line with funding, infrastructure needs of the utility and the water demand. The following language is suggested:

1. The County commits to drill, equip and connect wells according to the Utility Master Plan currently in the draft stages. The county also commits to purchasing the appropriate amount of water rights to provide back-up to the BDD.

Well No. 1 to serve the northwest sector and Well No 2 to serve the south sector.

Well No. 3: Before County BDD demand exceeds 1000 AFY

Well No. 4: Before County BDD demand exceeds 1500 AFY

Well No. 5: Before County BDD demand exceeds 2000 AFY



2. The County will use the 500 acre-feet of water described in the Water Resources Agreement with the City to provide the primary backup supply until County wells go on line. Thereafter, the County will use the Water Resources Agreement as a secondary backup supply when the County reaches the limit of its available water rights.

3. The County commits to drill and equip a monitoring well for each contingency / back-up well before any pumping, other than test pumping, occurs on the latter.

4. The County commits to securing funding for each well project by placing the project on the Capital Improvements Plan (CIP) associated to a high priority.

5. If, during exploratory investigation, a well location proves unsuitable for a well, the County will drill a replacement well at another location. The replacement well will be subject to the same permit conditions as the well it is replacing.

6. If the combined capacity of all five wells is deemed insufficient to meet peak County demand, at any time in the future, the County will either a) modify the construction of one or more well while continuing to meet permit conditions, or b) drill a supplemental well at another location. Any supplemental well will be subject to the same permit conditions as the original five wells.

## Recommended Well Locations

The final Focus Group Selection of Conjunctive Management Wells took into account depletions to La Cienega and La Cieneguilla springs in the basin, impacts to streams, drawdown to the aquifer, cost estimates and staging to analyze the economic and environmental feasibility of the proposed well sites. It was the consensus of the Water Focus Group that based on the analysis performed along with outlined precautionary measures the following well locations are suggested for back-up wells as described in the Conjunctive Management Plan for the Santa Fe Basin and were presented to the public.

Well Name	Location of Well
Las Campanas Site	Off La Tierra Road in the Vicinity of the Fire Station
Tank Line Site	Located near the Rancho Viejo Booster Pump
Caja del Rio Site	Off Caja del Rio Road near the Animal Shelter
Fair Grounds Site	At the County Fairgrounds Facilities off Rodeo Road
Rail Trail Site	Along the Rail Trail at the end of 9 Mile Road



## Public Outreach

The Board of County Commissioners had required the Water Focus Group to make a recommendation for effective public outreach as a part of their work. The first step taken toward that goal was to send out letters of introduction to known Homeowner Associations in Santa Fe County. These letters aimed at letting the various communities know where information on this project would be made available located on the County webpage and appropriate staff contact information.

Once the well locations and preliminary site specific analysis was performed three public meetings were scheduled to present the analysis and well locations and to seek input from the public. To advertise for these meetings three methods of advertisement were employed as follows:

1. Advertisement Posters were hung in various locations around the project area.
2. Placed ad in Newspaper
3. Sent out 700 letters to surrounding homeowners



The meetings were held as follows:

June 14<sup>th</sup>, 2011: Recommendation to the Board of County Commissioners from the Water Focus Group Regarding Conjunctive Management Wells and Public Outreach

April 26<sup>th</sup>, 2010 at the Nancy Rodriguez Center  
May 10<sup>th</sup>, 2010 at the County Fairgrounds Annex  
May 19<sup>th</sup>, 2010 at the La Cienega Community Center

The most effective form of advertisement was the letter sent out to homeowners as the letters generated the greatest turnout.

The public was skeptical at first but became more comfortable with the project as the meetings progressed. The focus group added credibility and defensibility to project as they were able to clarify issues and answer questions as they arose. Meeting notes can be found in Appendix E.

## **Office of the State Engineer Application**

An additional directive from the Board of County Commissioners was a recommendation for language for any groundwater application proposed by Santa Fe County to assure protections are in place. It was very important to the group that the policy set forth in the Conjunctive Management Plan was clearly stated in the groundwater application specifically that the wells will be used for back-up only and minor maintenance pumping. In addition to this language a conceptual surface and groundwater monitoring plan and the staging plan will also be included with the application. The recommended application language can be found in Appendix F.

## **Recommendation of Water Focus Group**

The consensus of the Water Focus Group is that the original task of modification of the pending groundwater application and recommending appropriate public outreach has been completed. As such, the Water Focus Group offers the following comments and recommendation to the Board of County Commissioners for consideration:

- Sufficient Public Outreach was performed for this project
- To address immediate back-up supply issues use the 500 acre-feet of water from the Wheeling Agreement between the City of Santa Fe and Santa Fe County initially. This will allow time to assess the duration and frequency of in –operation of the BDD.
- Continue to work with the City of Santa Fe to partner in regional back-up strategies and implementation of the Water Resources Agreement
- Include the proposed protective language and monitoring plans in any application to the State Engineer to insure implementation of the policy outlined in the Conjunctive Management Plan.
- Draft a Santa Fe County Utility Master Plan which addresses funding and staging of back-up wells and the acquisition of in-basin water rights.
- Seek grant funding for a pilot project to explore the aquifer potential for proposed well locations
- Discontinue City Bulk Water as back-up when wells are on-line to the extent possible.

Through the work of the Water Focus Group other alternatives and policy issues were identified. Due to the limited charter of this group the evaluation of additional topics would require additional public input and the

change or extension of the tasks requested from Board of County Commissioners. To this end, the Water Focus Group the following future action is recommended:

- Formalize this group as a recommending body by resolution which would require appointment of members by the BCC
- Update the Conjunctive Management Plan to reflect changes which have occurred since the original plan was drafted in coordination with the Water Focus Group and county staff
- Hold scoping meetings to look at alternatives to wells as back up supply such as hybrid or Aquifer Storage and Recovery wells
- Hold Public Meetings and have consultation with stakeholders in the basin
- Return to the BCC with an expanded recommendation for Board consideration

If the Board of County Commissioners feels the work of the Water Focus Group is completed and an additional scope is unnecessary at this time; the Water Focus Group respectfully offer their recommendation and thank the Board for allowing this process to occur.





## **Appendix A**

### ***Suitability Factors:***

12 separate maps based suitability factors were selected and given varying importance or weight in this analysis. Each factor was ranked for High Suitability, Moderate Suitability and Low Suitability and assigned a numeric value of 3, 2 and 1 respectively.

Maps of the Factors 1 through 11 were created using Arc Map and ranked into the 3 categories. 10 meter grids of these maps were created to allow easy adding of the suitability factors. Factor 12 was placed directly on the final map as it was a black-out zone. Once ranked, each factor was added together to arrive at a grand total.

### **Factor 1-**

#### **Areas of Favorable Hydrogeology**

Recent geologic mapping by the New Mexico Bureau of Geology and Mineral Resources of the Espanola Basin were utilized to characterize the shallow saturated geologic units within the study area. Pump tests from various consultant reports were reviewed to verify well production capability for various geologic units.

The area with saturated Tesuque Formation is the highest ranked hydrogeologic unit due to the lithology, demonstrated well production and location to recharge from the Sangre de Cristo Mountains.

Precambrian Granite and Permian units, located in the mountain and El Dorado areas, have decent well yields where fractures are encountered in the well. Unfortunately the fracture zones tend to be discrete and not present in all wells that are drilled. Due to uncertainty for the nature and extent of the fractured rock this hydrogeologic unit is ranked moderate.

Units that are not known for great well yields such as the Cerrillos intrusive complex, the Galisteo and Espinazo Formations were ranked as low suitability.

### **Factor 2-**

#### **Proximity to Areas of Known Arsenic Contamination**

In 2004 a water fair was held as a collaboration between Santa Fe County, New Mexico Environment Department (NMED) and Los Alamos National Laboratory (LANL). Water samples were obtained from domestic well owners who brought in samples for analysis. Field parameters including pH, temperature and specific conductance were recorded and the sample was split. LANL analyzed the samples for trace elements, trace metals and general chemistry. Field testing for fluoride, iron, nitrate and sulfate was conducted by NMED. Wells were located remotely by Santa Fe County using aerial photography. This water fair was focused primarily in the Rio Pojoaque, Rio Nambe and Rio Tesuque watershed which is outside of the study area for this project.

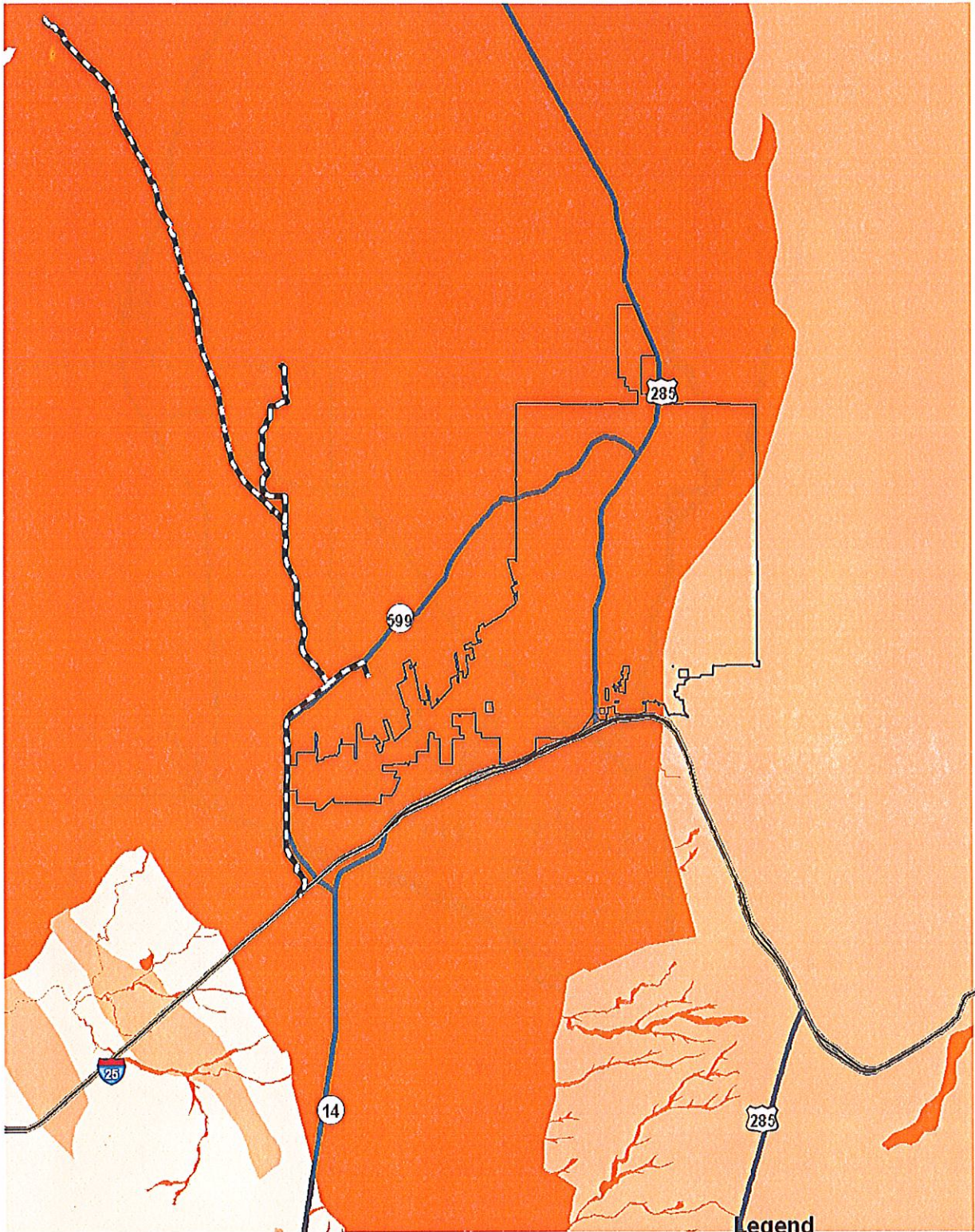
In 2005 the Bureau of Geology and Mineral Resources sampled ground water from 50 locations within the Santa Fe Embayment area of the Espanola Basin for major and minor ion and trace element chemistry (38 elements), oxygen-18 and deuterium, and field measurements of specific conductance, dissolved oxygen and pH. The data are derived from wells, streams and springs, including municipal, commercial, and private domestic wells, and the NMOSE multi-level piezometers.

In 2009 Santa Fe County, City of Santa Fe, NMED and LANL collaborated to do an on-site water fair where staff obtained samples from individual wells via an out-door spigot and took field parameters for pH, temperature and specific conductance as well as a GPS reading of the well. This event took place in the greater City of Santa Fe area. There were over 500 requests for water sampling; the data set utilized in this analysis is all samples where location of wells appeared to be reasonable.

After a review of all the available water quality data within the study area the contaminant of concern for this study is arsenic. Arsenic is naturally occurring in this basin and there is a distinct plume on the west side where the source is presumed to be the basalt of the Caja del Rio. It is also speculated that structural features in the basin are conduits for the upwelling of older, arsenic rich water. There are also pockets of high arsenic to the south of the study area but the source here is not as well defined and is presumed to be related to volcanic activity associated with Cerrillos Hills.

To map where arsenic is present a shape file was created indicating the location and quantity of arsenic sampled. The ArcGIS Spatial Analyst Natural Neighbor tool was utilized to interpolate areas of arsenic contamination. Natural neighbor interpolation formula finds the closest subset of input samples to a query point and applies weights to them based on proportionate areas in order to interpolate a value. Its basic properties are that it's local, using only a subset of samples that surround a query point, and that interpolated heights are guaranteed to be within the range of the samples used. It does not infer trends and will not produce peaks, pits, ridges or valleys that are not already represented by the input samples.

The data was broken up into three groups where the High suitability is less than Maximum Contaminant Level of 0.01 parts per million. Moderate suitability was set within margin of error for Maximum Contaminant Level which is approximately 0.001 part per million for this data set. For samples that exceeded the Maximum Contaminant Level past the margin of error low suitability was assigned.



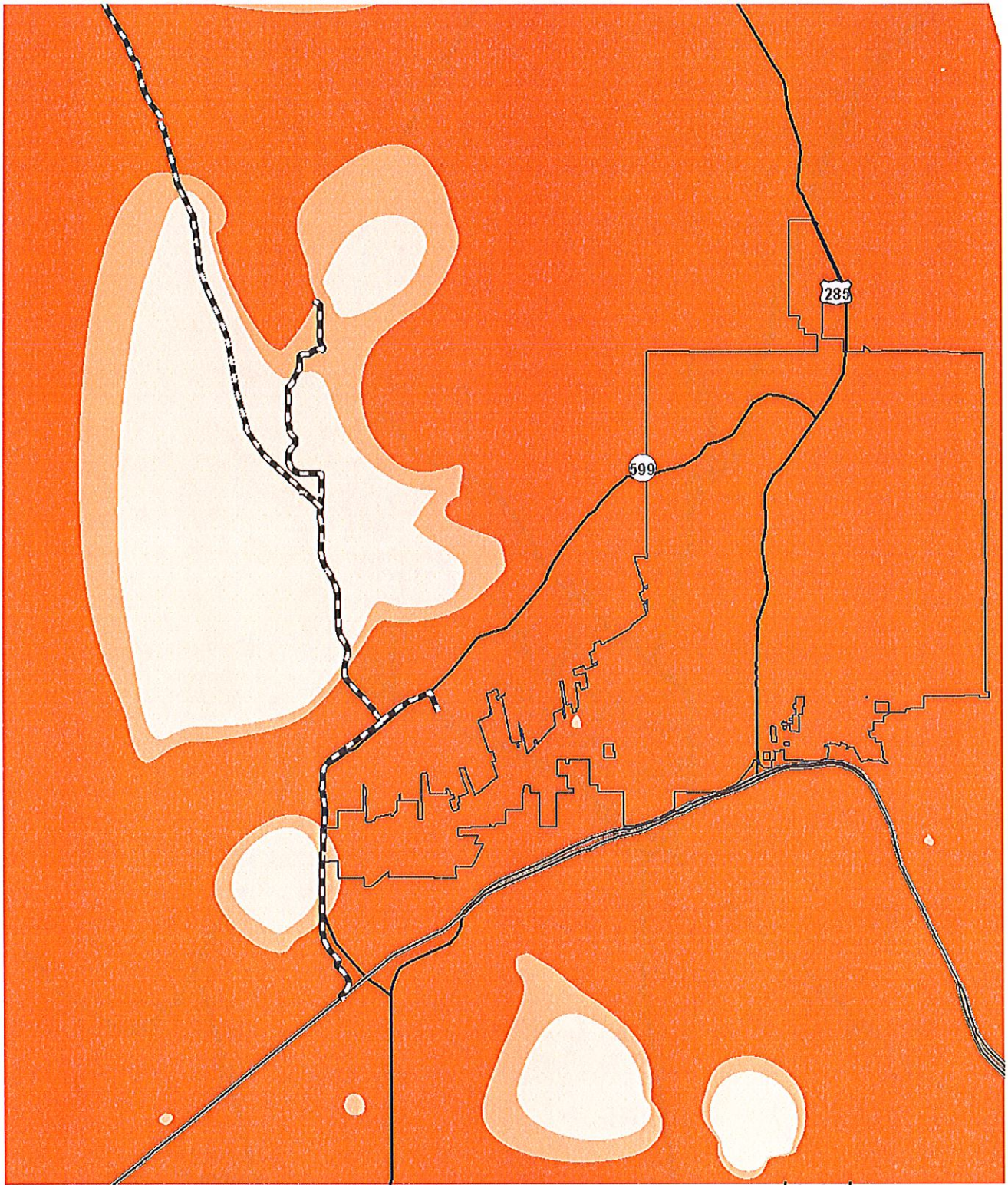
**Legend**

- Low Suitability
- Moderate Suitability
- High Suitability
- City of Santa Fe
- BDD PIPELINES

**Factor 1 :  
Areas of Favorable Hydrogeology**







**Factor 2 :**  
**Proximity to Areas of Existing**  
**Arsenic Groundwater Contamination**

**Legend**

- Low Suitability
- Moderate Suitability
- High Suitability
- City of Santa Fe
- BDD PIPELINES

0 1 2 4 Miles

### **Factor 3-**

#### **Areas Served by Domestic Wells**

To estimate areas where domestic wells are in use several datasets were utilized. Known areas served by either municipal, County or community water systems were estimated using parcel data, water line data and 2008 aerial photography. Utilizing the SFC Structures Dataset the residential structures outside of these known active service areas (where infrastructure exists) were selected. The presumption was made that if a residential structure exists outside an area currently served by a water system; the home obtains water from a domestic well.

The ArcGIS Spatial Analyst Point Density Tool was used to make a 1000 by 1000 foot grid to calculate the magnitude of homes per cell that falls within a 2 cell distance from a central cell. Point Density calculates the density of point features around each output raster cell. Conceptually, a neighborhood is defined around each raster cell center, and the number of points that fall within the neighborhood is totaled and divided by the area of the neighborhood. A density of 0 or 0 residential structures per cell was given high suitability. For moderate suitability a density of 1 or 1 residential structure per cell was selected. A density of greater than 1 or more than 1 residential structure per cell is considered low suitability.

### **Factor 4-**

#### **Feasibility of Pressure Zones**

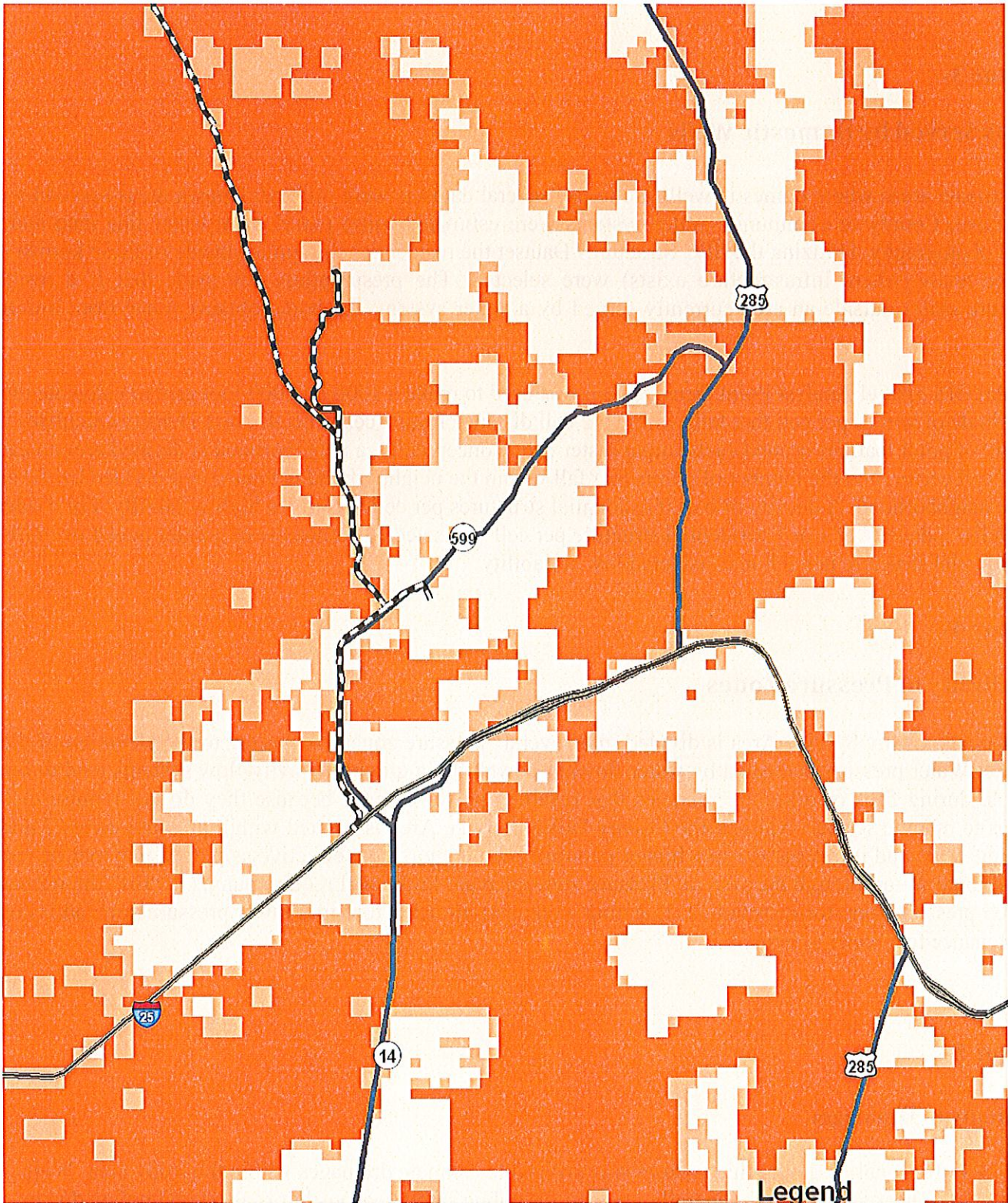
The County Utility Service Area is divided into several "pressure zones" according to the elevation of the land surface. Water pressure is created by water flowing downhill via gravity. Gravity-flow systems tend to be more reliable during fires or other emergencies that result in power outages because they do not require electrical pumps to operate service. Most of the County Utility Service Area is located within pressure zones 7 and 8 so locating wells and infrastructure in a higher pressure zone is more cost effective as pumps may not be required to distribute water through the system. Pressure zones that are lower will require pumps to "lift" the water to the desired pressure zone for distribution. Locating wells and infrastructure in a lower pressure zone adds cost and maintenance to a water system.

### **Factor 5-**

#### **Proximity to Drainages**

The USGS National Hydrographic Dataset was utilized to estimate drainages within the study area. Wells location in or near a drainage is generally avoided for public safety reasons but is also good policy due to potential riparian habitat. A set back of 100 feet was selected for low suitability. For moderate suitability a distance of 100 to 500 feet was selected. High suitability is considered to be greater than 500 feet from a known drainage.





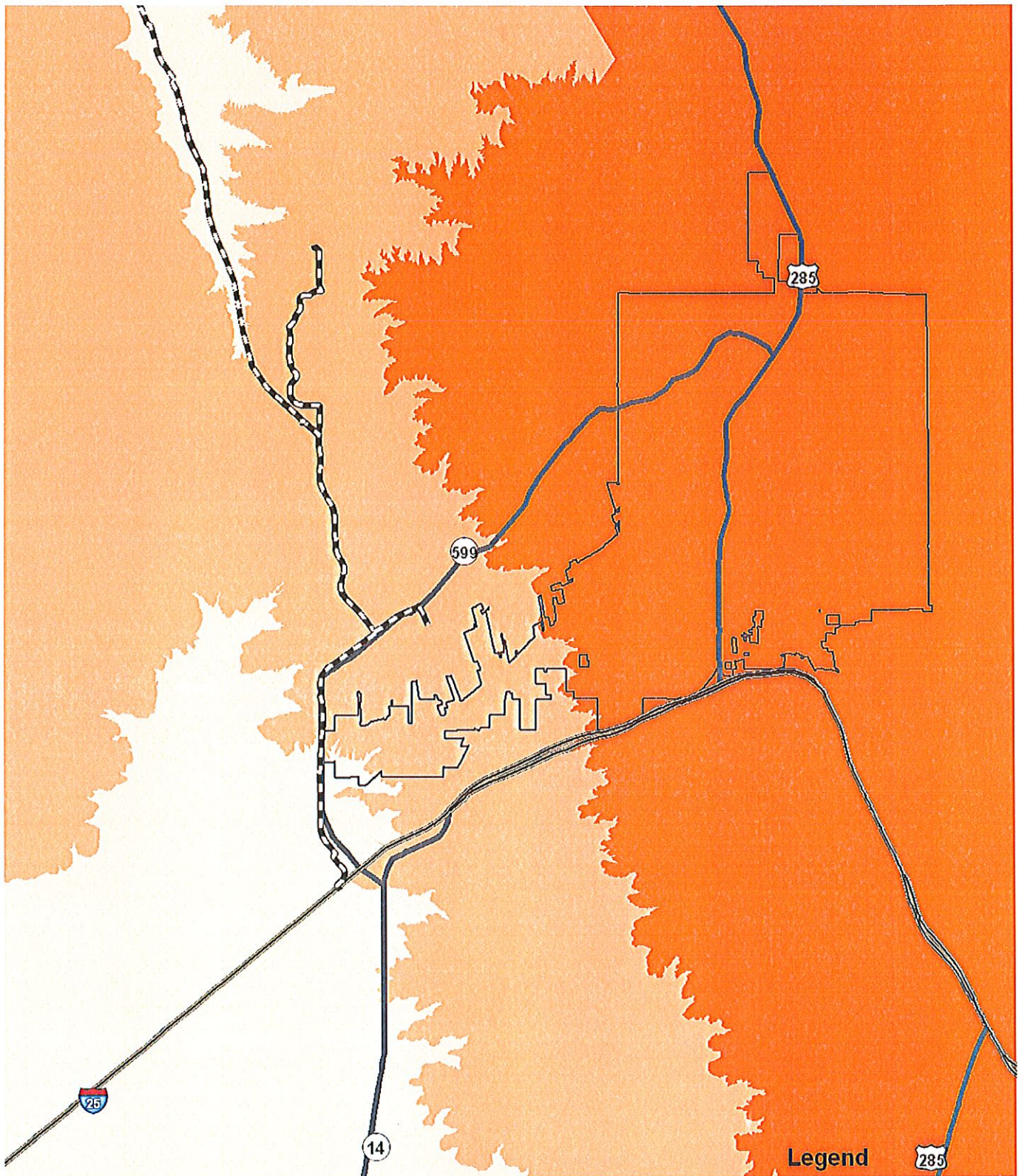
**Factor 3:  
Residences Served by Domestic Wells**



**Legend**

- Low Suitability
- Moderate Suitability
- High Suitability
- BDD\_PIPELINES\_4-2-08





Factor 4:  
Feasibility of Pressure Zones

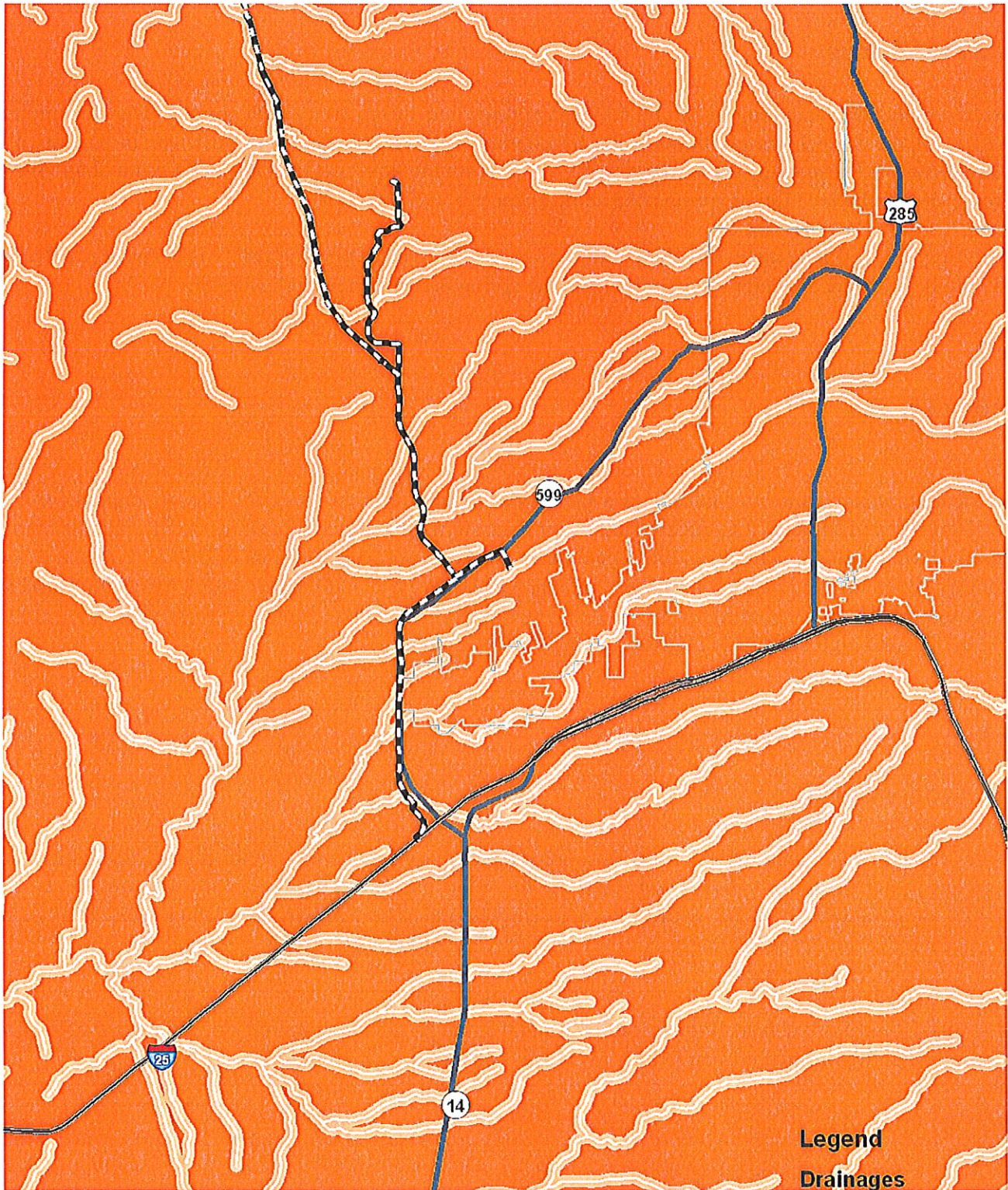
**Legend**

- Low Suitability
- Moderate Suitability
- High Suitability
- City of Santa Fe









- Legend**
- Drainages**
- Low Suitability
  - Moderate Suitability
  - High Suitability
  - BDD PIPELINES
  - City of Santa Fe

Factor 5:  
Proximity to Drainages

0 1 2 4 Miles





## **Factor 6-**

### **Proximity to Springs**

The most comprehensive mapping of the La Cienega springs and sumps (improved springs) was accomplished by the Office of the State Engineer through the hydrographic survey of the Santa Fe River in support of the Anaya Adjudication. These maps were georeferenced to 7.5 minute quadrangle maps and a point shape file was created representing the location of springs and sumps near the study area.

Low suitability of a well location is less than ½ mile from a spring; moderate suitability is defined as between ½ mile and 1 mile. A distance greater than 1 mile from the spring is considered high suitability.

## **Factor 7-**

### **Proximity to Faults**

To avoid locating wells in known fault zones a factor was created utilizing recent geologic mapping from the Bureau of Geology and Mineral Resources. This factor is not to be used in place of a site specific analysis but more to note the known locations of faults as areas that are sensitive. A setback distance of 100 feet was selected as low suitability based on the uncertainty of how a fault will behave. A fault can act as a barrier to groundwater flow or a conduit for flow depending on the nature and extent of the faults. Moderate suitability was estimated at 100 to 300 feet and high suitability at greater than 300 feet from a fault.

## **Factor 8-**

### **Areas of Aquifer Decline**

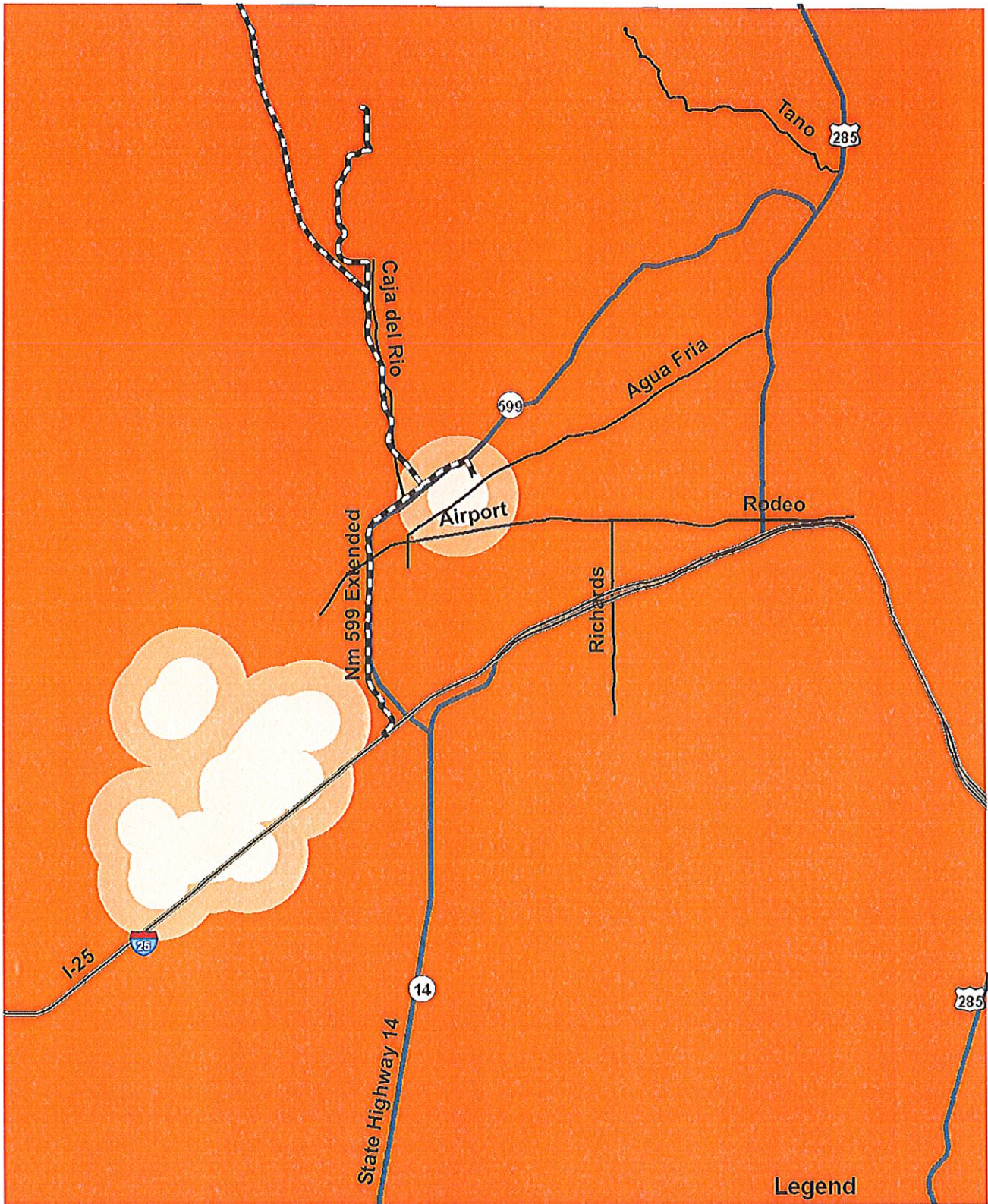
In 2003 the Bureau of Geology and Mineral Resources created a water level contour map which estimated an area of decline. This map was georectified utilizing Arc Map and the area of decline was traced. To avoid exacerbating a known decline of the aquifer this area is treated as sensitive. Updated water level data has been received but time did not allow for analysis to see if the area noted in 2003 has increased or decreased. Further study of this issue is recommended.

Low suitability is within 500 feet of the noted area of decline. Moderate suitability at a distance of 500 to ½ mile and high suitability of greater than ½ mile away was selected.

## **Factor 9-**

### **Slope**

Slope data utilized for this analysis was obtained from the Santa Fe County GIS Server. The actual source of the data was not documented but is presumed to be derived from the 10 meter Digital Elevation Model data obtained from the USGS



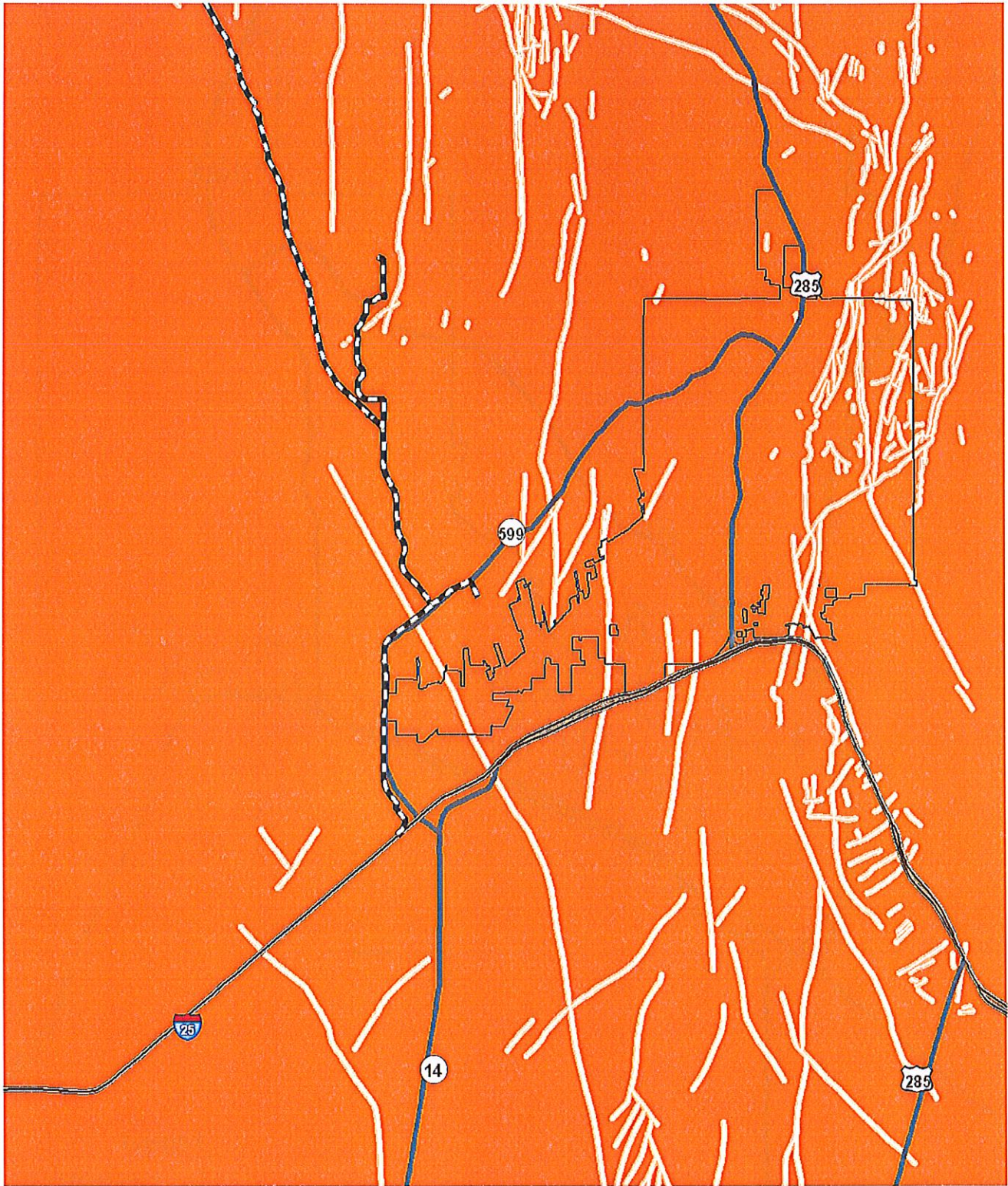
**Factor 6:**  
**Proximity to Springs and Sumps**

0 1.25 2.5 5 Miles

- Legend**
- Low Suitability
  - Moderate Suitability
  - High Suitability












Factor 7:  
Proximity to Faults

Legend

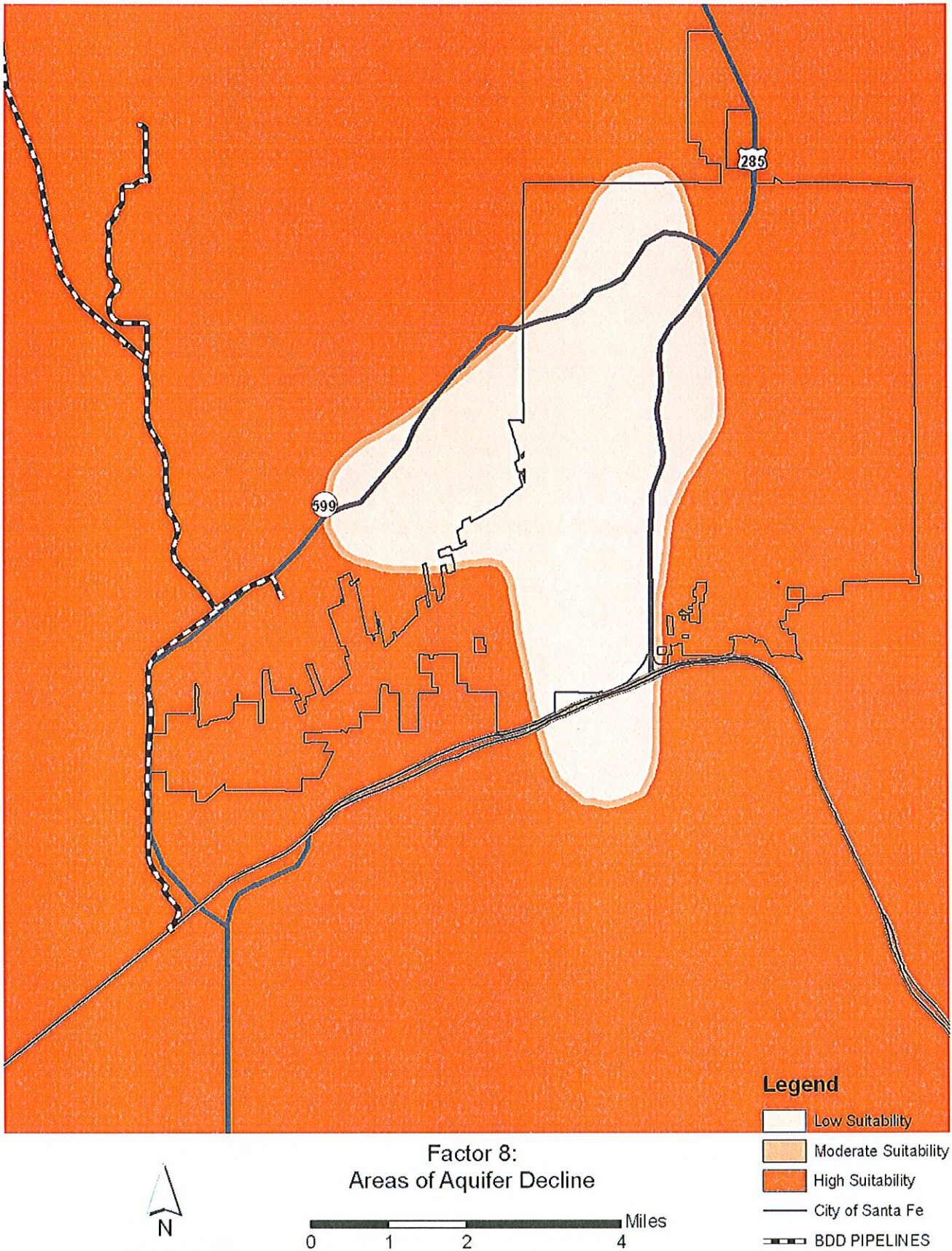
Faults

-  Low Suitability
-  Moderate Suitability
-  High Suitability
-  City of Santa Fe
-  BOD PIPELINES

Ar  
M:

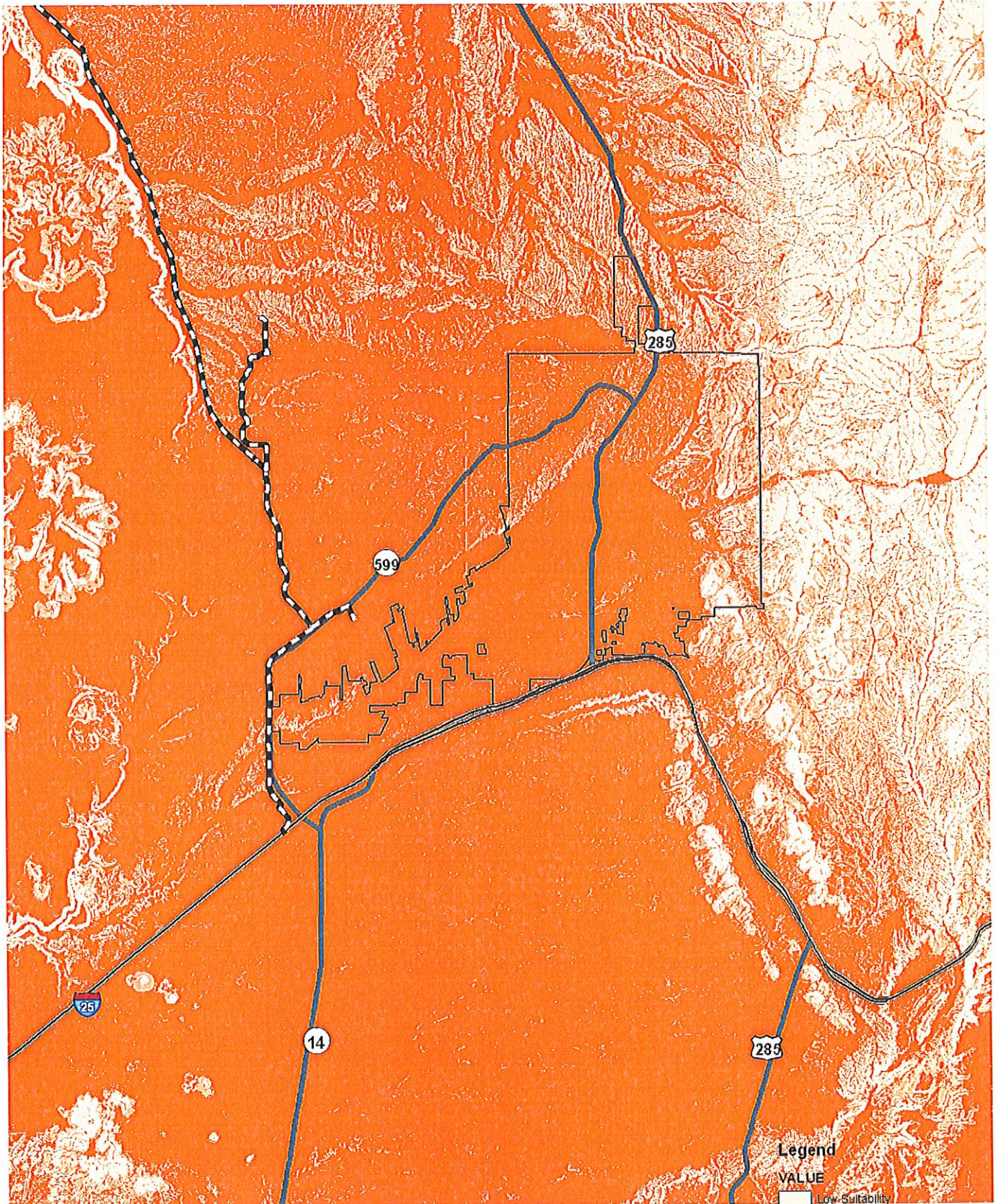






Appendix A: Recommendation to the Board of County Commissioners from the Water Focus Group Regarding Conjunctive Management Wells and Public Outreach





Factor 9:  
Slope-Percent Grade

**Legend**

VALUE

- Low Suitability
- Moderate Suitability
- High Suitability
- City of Santa Fe
- BDD PIPELINES





## **Factor 10-**

### **Distribution Potential**

With the assistance of CH2M Hill a map was created which addresses the ability of the County Utility to deliver water. There is certain infrastructure that, with the proper water trading agreements with the City of Santa Fe, water delivered at that location from a well can serve all the current customers on the utility. As a result of this analysis a previous factor called Proximity to Major Water Lines was eliminated due to redundancy of the data.

High Suitability was defined as the ability to serve all the County utility. Moderate Suitability can serve a portion of the utility and Low Suitability areas cannot easily serve all the utility.

## **Factor 11-**

### **Distance to Community and Municipal Wells**

An existing data set from the 2006 Intra analysis was utilized to create this map. A distance of greater than ½ mile away from a well is considered high suitability. This distance was selected based on modeling efforts in the area; in general the calculated drawdown lessens greatly when the distance from the pumping well is greater than ½ mile. Moderate suitability is between 1000 feet and ½ mile away from well and low Suitability is set at less than 1000 feet from a well.



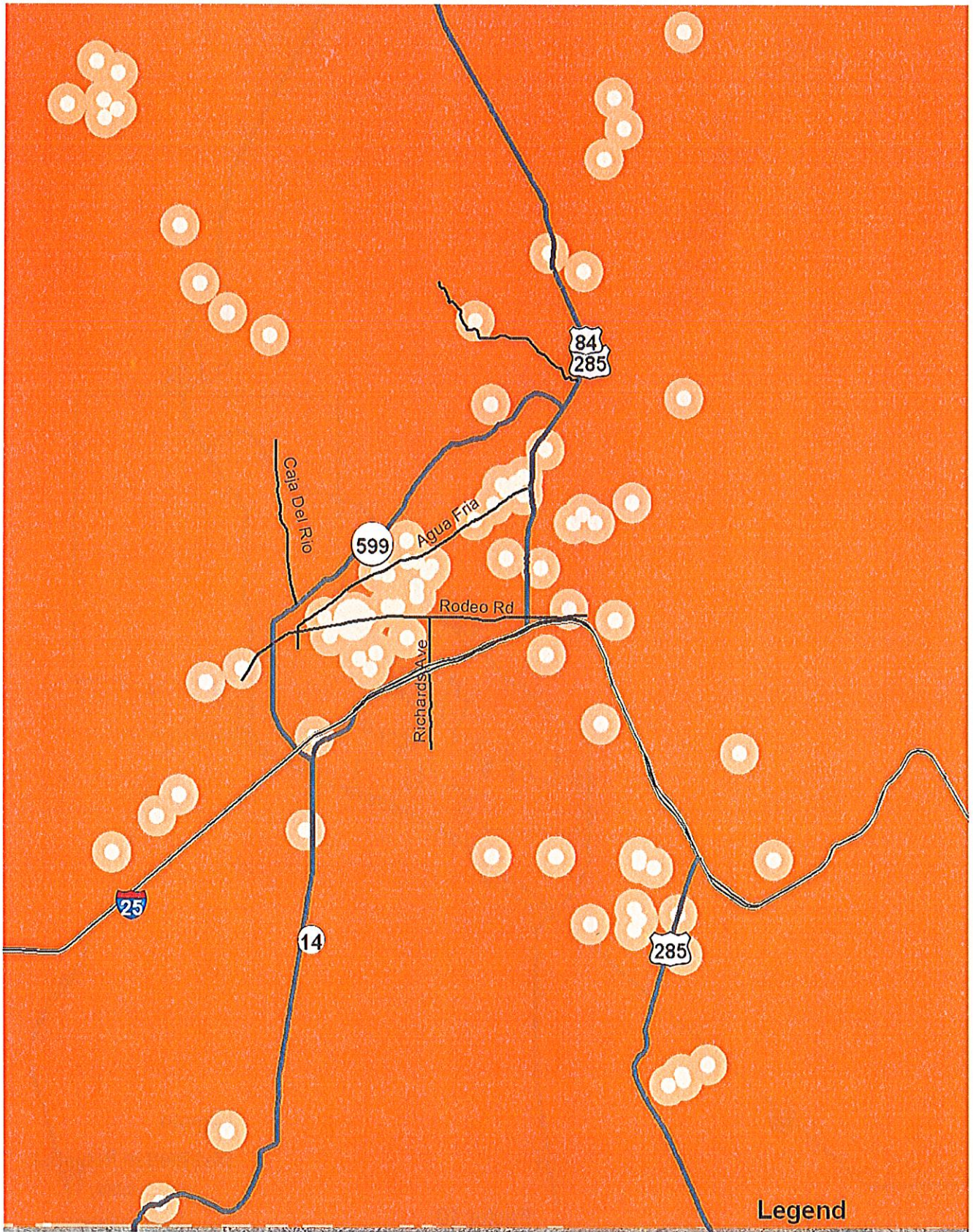
Factor 10:  
Distribution Potential



- Legend**
- Distribution Potential**
- Low Suitability
  - Moderate Suitability
  - High Suitability
  - City of Santa Fe







Factor 11:  
Distance to Community and Municipal Wells



- Legend**
- Low Suitability
  - Moderate Suitability
  - High Suitability



## Appendix B

### Assumptions used for 10 year moving average scenarios

#### Worst Case Scenario: BDD Inoperable Assumptions

1. Full Build out of SFC system and Las Campanas is 2404 acre-feet.
2. Santa Fe County will reduce the total demand by 10% through conservation. (240 acre-feet)
3. City of Santa Fe will provide 765 acre-feet of Back-up Supply to Santa Fe County.
4. Total Back-up Requirement is 1,399 afa (2,404 – 10% - 756)
5. 8 month demand is estimated to be 1,200 acre-feet taking into account peak demand months. (approximately 86% of supply)

#### Most Lilly Scenario: 5 Year Drought Scenario Assumptions

Based on historic flow data recorded at Otowi Gage a curtailment event is predicted to last no more than 4 months. During peak usage June – September 48% of the total demand will require back-up.

1. Full Build out of SFC system and Las Campanas is 2404 acre-feet.
2. 48% of supply will be required to back up which equals 1,154 acre-feet.
3. Santa Fe County will reduce the total demand by 10% through conservation. (115 acre-feet)
4. City of Santa Fe will provide bottom half protection of 518 acre-feet.
5. San Juan Chama Water in storage will be utilized (468.75 acre-feet)
6. Back up demand is estimated at 52.25 acre-feet per year utilizing stored San Juan Chama Water.
7. Back up demand is estimated at 570 acre-feet per year without stored San Juan Chama water used.

#### 10 Year Worst Case Back-up Scenario

The following 10 year scenario will be repeated 10 times to estimate drawdown and depletion for 100 years. The total diversion of water for this 10 year period is 2,345 acre-feet. Figure XX is a chart of this scenario.

**Year 1** = 5 wells pumping 250 acre-feet each for a total of 1,200 acre-feet to simulate BDD failure.

**Years 2 - 4** = 5 wells pumping 10.45 acre-feet each for a total of 52.25 acre-feet per year to simulate 3 year drought with stored SJC water available.

**Year 5** = 5 wells pumping 114 acre-feet each for a total of 570 acre-feet per year to simulate 1 year of drought without stored SJC water available.

**Year 6** = 5 wells pumping 114 acre-feet each for a total of 358.25 acre-feet per year 1 year of drought without stored SJC water

**Years 7-10** = 5 well pumping 3.0 acre-feet each for a total of 15.0 acre-feet each year to simulate maintenance pumping

### **10 Year Most Likely Scenario**

**Year 1** = 5 wells pumping 52.9 acre-feet each for a total of 264.5 acre-feet per year to simulate 1 peak month of BDD downtime per year

**Years 2 -4** = 5 well pumping 3.0 acre-feet each for a total of 45.0 acre-feet per year to simulate maintenance pumping.

**Year 5** = wells pumping 52.9 acre-feet each for a total of 264.5 acre-feet per year to simulate 1 peak month of BDD downtime per year)

**Years 6 -10** = 5 well pumping 3.0 acre-feet each for a total of 45.0 acre-feet per year to simulate maintenance pumping

## Appendix C

### Methodology to Simulate Drawdown to the Aquifer Due to Pumping

#### *Boundaries*

Though the Santa Fe River is approximately 1 mile to the south of the Caja del Rio well site, flow in this reach of the river occurs seasonally due to releases from the City of Santa Fe Reservoir. For this reason a flow boundary representing the Santa Fe River was not utilized.

A review of the New Mexico Bureau of Geology and Mineral Resources 2004 Espanola Basin Compilation Map (Map 1) shows several major and many inferred faults near almost all of the well locations. The primary fault evaluated on the west side of the study area is the San Isidro Crossing Fault which is approximately 2.8 miles to the east of the Caja del Rio Site 0.7 miles east of the Las Campanas site. The pump test from the well drilled for the Suerte del Sur subdivision was used to evaluate if faults or the Caja del Rio Basalts are acting as a low flow boundary. A review of this pump test did not show a boundary effect in this area but as more data is obtained this may change.

The Seton Village Fault is located approximately 0.4 miles to the east of the Rail Trail Well Site. To evaluate if this fault behaves as a low flow boundary a pump test for the Lujan Property was evaluated. (Transmissivity from this test was not used as the well is completed in the Precambrian Granite not the Tesuque Fm) During the first day of pumping the decline in water level was steep but by the end of the second day of pumping the water level decline tapered off indicating possible interception of a recharge boundary. This pump test is consistent with the interpretation of the OSE numerical model which shows a recharge boundary in this area. To be conservative no boundary was selected to represent recharge.

Near the, Las Campanas, Tank Line and Fairground Well Sites there are numerous inferred faults identified by aeromagnetic data. It is difficult to know if any of these inferred faults act as a low flow boundary without site specific data. Even with site specific data which may show a boundary, such as the pump test for the Rancho Viejo well, the geometry of the boundary is difficult to estimate. Due to uncertainty, no boundaries describing inferred faults were used in this analysis.

#### *Transmissivity*

Pump tests conducted which are representative of the Tesuque Formation were utilized to derive a range of transmissivities. The pump tests were reviewed and a transmissivity was estimated utilizing the Jacob Straight-line method and three ranges of transmissivity values were derived. The average value was utilized for this analysis to see if drawdown was an issue with the thought further modeling would be done is the predicted drawdown appeared excessive. The high, average and low transmissivity values as listed below:



High Transmissivity = 8,250 gpd/foot  
Average Transmissivity = 2,933 gpd/foot  
Low Transmissivity = 1,404 gpd/foot

Based on the modeling results the group was satisfied with the average transmissivity as a preliminary analysis but recognized as test wells are drilled these values will most likely change.

### *Storage*

A storage coefficient of 0.1 was used based upon lithology from well logs representative of the Tesuque Aquifer. A maximum storage coefficient of 0.15 is used for the Santa Fe Group (Ancha and Tesuque) by the County. This same specific yield or storage coefficient is used in Layer 1 of the OSE numerical model but due to the presence of clay layers common in the Tesuque a lower number is used in this analysis.

### *Quantity*

The quantity utilized for the worst case and most likely scenario model runs varies in acre-feet per year as described in the previous section with all the wells pumping equal amounts. The theis solver presumes a 100% pumping time which provides a worst case scenario for pumping, as the wells are not allowed to rest.

# Appendix D

## Monitoring Plans

### Conceptual Groundwater Monitoring Plan

- 1. Monitoring Area:** A circle with 2 miles radius from the County well is suggested due to anticipated low groundwater use through conjunctive management.
- 2. Monitoring Well Location:** The number and locations of monitoring wells will be chosen so that actual drawdown to sensitive areas and wells of other ownership, within the monitoring area can be assessed. Due to low drawdown shown by modeled scenarios, it is anticipated only 1 monitoring well will be necessary for each County Well location. However, if the actual drawdown associated with a County Well exceeds the drawdown modeled in the Worst Case Scenario (see Attachment A) by 10%, then the County will drill an additional monitoring well or wells or will implement another appropriate method to collect data to determine the basis, and potential effects of the unanticipated drawdown. Attachment A is the current modeled impacts but may be modified through the OSE permitting process.
- 3. Construction of a New Monitoring Well:** All new monitoring wells will be constructed to monitor the same screened interval as the County well but monitoring of the shallow aquifer may also be required.
- 4. Data Collection:** The County will perform monthly measurement of water levels to establish a seasonal baseline and a rate of regional decline. These results will be posted on the County Web Page no later than 30 days after collection.
- 5. Domestic Well Survey:** Prior to commencement of pumping of a County well, the County shall conduct a survey within the monitoring area to estimate the location of existing domestic wells, the height of their water columns and their construction. These estimates will be used as the baseline for projecting future percentage decline in water column.
- 6. Definition of Excessive Drawdown:** The OSE Hydrology Bureau Report 06-01 "Guidelines for the Assessment of Drawdown Estimates for Water Right Application Processing" provides guidelines for the allowable drawdown of a domestic well by a new application. "Excessive drawdown" is used below to mean any drawdown that exceeds the OSE guidelines. Excessive drawdown must be determined for each well on a case-by-case basis using the OSE guidelines. Excessive drawdown is only applicable to a "senior" well that was drilled before the County permit is issued.
- 7. When Excessive Drawdown or Depletion is Projected:** Based on collected water level data a 10 year and 40 year projection of water level declines to the monitored wells and other wells in the monitoring area will be calculated.

If the projection shows that a senior well in the monitoring area will have excessive drawdown within 10 years then the County will confer with the OSE to determine the cause, and to create a plan to either prevent

the excessive drawdown from occurring, or to mitigate the excessive drawdown pursuant to paragraph 11 below.

If the projection predicts depletions to springs or streams within 10 years in excess of the depletions predicted by the Worst Case Scenario (see above), then the County will confer with the OSE to determine the cause, and to create a plan to either prevent the depletion from occurring, or to mitigate the depletion pursuant to paragraph 11 below.

- 8. Claim of Current Excessive Drawdown or Depletion:** If the owner of any senior well, spring or stream claims the excessive drawdown or depletion in paragraph 7 is already occurring, the County, the OSE and the owner will confer to assess the claim. If the claim is verified, the County and the OSE will determine the cause, and create a mitigation plan pursuant to paragraph 11 below.
- 9. Third Party Contribution to Excessive Drawdown or Depletion:** The OSE and County may determine that groundwater use by parties other than the County is contributing to excessive drawdown or depletion. In this case, the OSE may require the other parties to take remedial actions separate from the County mitigation plan.
- 10. Biannual Report:** The County will prepare a biannual report that provides updated recorded water levels, well pumping records, and decline projections. The Biannual Report shall provide an analysis of the causes of any projected declines, whether any adjustments to pumping centers or schedules are required and whether an appropriate mitigation plan will be needed. Each report will be available on the County Web Page no more than 30 days since the last collection date for that calendar year.
- 11. Mitigation Plan:** The Mitigation Plan shall define the actions, and associated costs, for providing a water user with the same sustainable water flow as available before the excessive drawdown or depletion occurred. Depending on the situation there are 5 options for mitigation of drawdown to a domestic well.
  1. Reduce the pumping in the permitted County well
  2. Change pumping centers to minimize drawdown.
  3. Connect the well user to the water system with County paying fees as outlined in mitigation plan.
  4. Drill a deeper well to replace the impacted well with County paying proportional costs based on the projected lifetime of the well without County induced drawdown as outlined in mitigation plan.
  5. Or otherwise supply water to the well owner's property with the county paying for costs as outlined in the mitigation plan.

As required, the County may also deliver water to offset depletion caused to streams and springs.

The mitigation plan must be submitted to the Board of County Commissioners for approval within one year from the Annual Report containing the projection of excessive drawdown or depletion. However, if excessive drawdown or depletion has already occurred, or is imminent, the mitigation plan must be submitted within



three months of the County first becoming aware of the situation.

### **Conceptual Surface Water Monitoring**

To establish a baseline and to investigate patterns of changing conditions in the Santa Fe Basin and establish a baseline of surface water flow the following monitoring is proposed. It should be noted this monitoring is not proposed to measure surface water depletions due to the proposed pumping of County wells but to look at overall discharge to the La Cienega / La Cienguilla spring areas and Santa Fe River flows at La Bajada. The plan will attempt to better understand the impacts of regional groundwater pumping in order to avoid impairment of area streams and springs that serve senior water right owners. In order to implement this Plan the County shall perform the following functions:

1. Establish monitoring boundary
2. Monitor records of daily flow from the City of Santa Fe Wastewater Treatment Plant
3. Monitor records of daily flow on USGS Santa Fe River Gauge at La Bajada
4. Estimate contribution of La Cienga / La Cienguilla Springs to Santa Fe River flow (subtracting flows from the WWTP from flow at the Gauge at La Bajada).
5. Compile available data of groundwater pumping in the basin on an monthly basis.
6. Cooperate with other governmental entities in establishing Groundwater Monitoring Network with levels recorded on a monthly basis.
7. Monitor available Precipitation data (research)
8. Incorporate information regarding necessary surface water flows for existing irrigation infrastructure.

End product will be a biannual report which will be published on the county webpage. This report will synthesize this data, attempt to analysis patterns and make recommendations for future surface water monitoring.



## **Appendix E: Public Meeting Notes**

### **Public Questions and Comments from April 26<sup>th</sup> 2010 Meeting**

- Do the City and County share the same aquifer
- If it is the same, how do you know pumping won't impact springs and streams
- Note: The springs have a higher priority than these fights. This could result in a priority call
- What does the move-from column mean?
- Why does the model not show all of the water being taken out
- Are you putting the cart before the horse? Shouldn't you monitor first, then check the viability of the plan?
- Are you creating a utility for just future growth and nothing else?
- Will you have a storage system?
- How often is the water changed in the storage system?
- Will this plan deal with future extensions of the system?
- Statement: Trust issues with Local Governments
- Do developers need to purchase water rights?
- How much does it cost for water from the BDD vs from a well?
- How will you restrict Las Campanas during a drought?
- How did Las Campanas get the first phase using tax payer dollars?
- Does the County have any existing wells?
- Could you use the money to give water to people who don't have wells?
- Does "Monitoring Overall Pumping" include domestic wells?
- Can you include domestic wells in the model? We should monitor them.
- Use Building and structures to locate domestic wells
- Why doesn't the county enforce it's current rules that limit domestic wells? (like check metering)
- Why was Las Campanas allowed to break their contract?
- We will all be pumping water at the same time during a drought.

### **Public Questions and Comments May 10<sup>th</sup> 2010 Meeting**

- What is the timeline to full build out?
- Getting people off domestic wells.
- Anything about security: terrorism/ vandals
- How many water rights does the county own vs. commitments?
- Where is the area in blue going to be?
- Aside from backup, what will the wells be used for?
- Will you go back later and reapply so these can be production wells?
- What is the rate of decline at Las Campanas?
- Are you aware of the 1950's data?
- Using well inspection data from real estate sales.
- Is the moratorium on private well drilling?



- Will the county wells be located on county, private, or federal lands?
- Is 2 miles radius or diameter?
- What is “made whole”?
- What happens when all of the wells in a neighborhood go dry?
- Why do you even need these wells?
- How do we guard against a bad future commission?
- Where are the community and municipal wells?
- How will the raw water get into the system?
- What treatment is needed?
- How much will this cost taxpayers?
- Aren’t the wells expensive?
- Why do you need a booster pump if the BDD is down?
- Why don’t you use the Rancho Viejo well?
- Could it be purchased later?
- Why have well instead of having a better BDD?
- Is 8 months a good number for downtime?
- Water should not be degraded by new wells. Each well should be equal rather than averaging in new contaminants.
- How do you compensate for the cities impact if they create a backup plant that uses backup wells? How about if you pump while they pump?
- CAN’T DIRECTLY ACCESS WEBSITE

## Appendix F: OSE Application Language

### 5. ADDITIONAL STATEMENTS OR EXPLANATIONS:

Santa Fe County, in partnership with the City of Santa Fe, is in the process of completing construction of a major surface water diversion project on the Rio Grande known as the Buckman Direct Diversion (BDD). Located on the Rio Grande downstream of the Los Alamos (Otowi) Bridge, the BDD will divert, treat and transmit water for use in the County and City respective water utility service areas. This project is vital to the Santa Fe area because it will relieve demand on limited local water resources and provide an imported and renewable supply from the Rio Grande. Beginning in 2012, the primary source of supply for the County water utility will switch from local supplies to water provided from the BDD, both from the San Juan-Chama Project and native Rio Grande surface water.

The purpose of this application is to implement the Santa Fe County Conjunctive Management Plan for the Santa Fe Basin by obtaining a State Engineer permit for local groundwater wells to be used as back-up or drought reserve in times of operational stoppage or surface water shortage on the Rio Grande. Although Rio Grande shortages at the location of the BDD have occurred rarely in the past, the County wants to assure that sufficient back-up supplies are available when shortages do occur or in the event BDD operations are temporarily curtailed.

At full capacity, the County will divert approximately 2,400 acre-feet per year of water from the BDD. In order to provide back-up supply, the County is seeking an average of 240 acre-feet per year of groundwater back-up from five wells in the Santa Fe Basin. Because in most years the back-up supply will not be needed, this application requests a 10-year moving average so that unused groundwater will accrue to the County drought reserve. Such a drought reserve would afford up to 2,400 acre-feet during any period of 10 years. For further description of the proposed drought reserve and 10-year moving average, please see the Conjunctive Management Plan ([http://www.santafecounty.org/growth\\_management/waterwastewater\\_operations](http://www.santafecounty.org/growth_management/waterwastewater_operations)).

In December 2009, the Board of County Commissioners established the Water Focus Group to assist with implementation of the groundwater component of the Conjunctive Management Plan. Because of the importance of conserving local groundwater supplies and protecting surface flows, including from fragile springs, the County Commission appointed five county residents to the Water Focus Group:

- Jose Varela Lopez – La Cieneguilla / La Cienega
- John Miles Smith – Santa Fe County Northwest
- David Gold – Santa Fe (west of city)
- Rod Hall – Galisteo
- Walter Wait – San Marcos

The Water Focus Group has played an invaluable role in assisting the County to implement the Conjunctive Management Plan, by working closely with Utilities Director Marvin Martinez, County Hydrologist Karen Torres and other county staff to locate the five proposed wells and to

Appendix F: Recommendation to the Board of County Commissioners from the Water Focus Group Regarding Conjunctive Management Wells and Public Outreach

develop conditions to minimize effects from county well pumping. The Water Focus Group and county staff also prepared a well and surface water monitoring plan and well staging plan proposed to be made a part of a revised Conjunctive Management Plan. The Water Focus Group convened more than a dozen times to carry out its work and engaged in extensive public outreach, culminating in the following three public informational meetings:

April 26, 2010	Nancy Rodriguez Center (conceptual review)
May 10, 2010	Santa Fe County Fairgrounds; and
May 19, 2010	La Cienega Community Center

In addition, the Water Focus Group participated in a public presentation before the Board of County Commissioners on June 8, 2010 and attended the Board of County Commissioners meeting on August 31, 2010, at which the Board approved submission of this application to the State Engineer.

In order to implement the Conjunctive Management Plan, as recommended by the Water Focus Group and county staff, the County requests that the State Engineer place the following terms and conditions on the use of the five wells proposed by this application:

1. The proposed wells will pump water only during times that supply to the County from the BDD is reduced or interrupted because of drought or other catastrophic conditions (e.g. extreme drought, acts of sabotage, water quality restrictions, OSE/ISC or other legal or regulatory restrictions, or other malfunction, failure, or stoppage of BDD operations). The only exception is routine maintenance to keep the wells in good working order or to keep sufficient water pressure in the system as described in the Conjunctive Management Plan.
2. In the event of unavailability of native surface water for diversion at the BDD for use by the County, the County will seek next to divert its available San Juan Chama Project water, whether available for direct diversion or for release from upstream storage, before pumping any of the five wells to provide back-up supply.
3. Santa Fe County will revise its Conjunctive Management Plan to include a Groundwater Monitoring and Mitigation Plan to avoid impairment of nearby wells of other ownership drilled prior to the granting of this permit.
4. Santa Fe County will revise its Conjunctive Management Plan to include a Regional Surface Monitoring Plan in order to compile available data regarding Santa Fe River flows, basin wide water levels, estimated spring discharge, precipitation and pumping in the basin area.
5. Santa Fe County seeks a 10 year moving average where the maximum amount of water diverted from all wells under this permit may not exceed 2,346.6 acre-feet for each 10 year period. The ten year period takes into account the water usage from the previous 9



years. The County may transfer additional water rights under separate application to achieve the 2,400 acre-feet necessary for full back-up.

6. Santa Fe County will complete all five wells over time as outlined in the staging plan attached as Exhibit B. Santa Fe County will divert water from all completed wells in order to distribute the pumping and avoid inequitable impact to water users in specific areas. No more than 600 acre-feet in total may be diverted from any well over a 10 year period.
7. Each year the County will submit an accounting of the total amount of water available for diversion from all wells under this permit as well as a breakdown of the maximum amount available to be pumped from each well, utilizing the sum of water diverted in total and from each well during the previous 9 years.

#### **ACKNOWLEDGEMENT**

GARDNER ASSOCIATES, LLC

Appendix F: Recommendation to the Board of County Commissioners from the Water Focus Group Regarding Conjunctive Management Wells and Public Outreach

By: \_\_\_\_\_  
\_\_\_\_\_

STATE OF NEW MEXICO    )  
  ) ss:  
COUNTY OF SANTA FE    )

This instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2006, by \_\_\_\_\_, \_\_\_\_\_ of Gardner Associates, LLC, a New Mexico limited liability company, on behalf of said company.

SEAL

\_\_\_\_\_  
NOTARY PUBLIC

CENTURY BANK FSB

By: \_\_\_\_\_  
\_\_\_\_\_

STATE OF NEW MEXICO    )  
  ) ss:  
COUNTY OF SANTA FE    )

This instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2006, by \_\_\_\_\_, \_\_\_\_\_ of Century Bank FSB, a \_\_\_\_\_, on behalf of said bank.

SEAL

\_\_\_\_\_  
NOTARY PUBLIC

**ACKNOWLEDGMENT**

SANTA FE COUNTY, a political subdivision of the State of New Mexico, affirms that the foregoing statements are true to the best of its knowledge and belief.

SANTA FE COUNTY  
A political subdivision of the State of New Mexico

By \_\_\_\_\_  
**County Manager**

STATE OF NEW MEXICO    )  
  ) ss:  
COUNTY OF SANTA FE    )

Before me appeared \_\_\_\_\_, with due authority as the **County Manager** of SANTA FE COUNTY, a political subdivision of the State of New Mexico, who provided satisfactory evidence of his/her identity and voluntarily acknowledged and signed this instrument on behalf of the Santa Fe County, this \_\_\_\_\_ day of \_\_\_\_\_, 2006.

SEAL

\_\_\_\_\_  
NOTARY PUBLIC

**ACTION OF STATE ENGINEER**

This application is approved/denied/partially approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare; and further subject to the following conditions: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Witness my hand and seal this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_

\_\_\_\_\_, State Engineer

By: \_\_\_\_\_





**THE BOARD OF COUNTY COMMISSIONERS  
OF SANTA FE COUNTY**

**RESOLUTION No. 2011- \_\_\_\_\_**

**A RESOLUTION ADOPTING RECOMMENDATIONS OF THE WATER FOCUS  
GROUP AND DIRECTING UTILITY STAFF TO UPDATE THE CONJUNCTIVE  
MANAGEMENT PLAN FOR THE SANTA FE BASIN**

**WHEREAS**, groundwater supplies in the Santa Fe Basin are considered a reliable but not a renewable supply of water and for this reason the aquifer underlying the Santa Fe Basin should be thought of as a supplemental source of water, not a primary supply;

**WHEREAS**, surface water from the Rio Grande delivered by the Buckman Direct Diversion is a renewable water supply but may suffer from reduced flows due to prolonged drought of other catastrophic condition;

**WHEREAS**, on March 19<sup>th</sup> 2008, the Board of County Commissioners ("the Board") approved its Resolution No. 2008-51 which accepted the proposed draft of the Conjunctive Management Plan for the Santa Fe Basin ("CMP"), directed staff to solicit public comment and formally consult with the Pueblos of Tesuque, Pojoaque, Nambe, San Ildefonso and the City of Santa Fe, and directing formal presentation of the final plan to the Board;

**WHEREAS**, on January 13<sup>th</sup> 2009, the Board approved, by resolution, the final CMP;

**WHEREAS**, on November 10, 2009, the Board directed staff to establish a "Water Focus Group" to provide more detailed public input, conduct additional technical analyses, and propose permit language and an effective public outreach process;

**WHEREAS**, on January 6<sup>th</sup> 2011, the Buckman Direct Diversion project became operational and began delivering water to the citizens of Santa Fe County; and

**WHEREAS**, based on the enormous time and effort put forth by the WFG, key recommendations and strategies were formulated that are of value to Santa Fe County

**NOW, THEREFORE, BE IT RESOLVED** by the Board of County Commissioners, as follows:

1. As provided in the report of the WFG, County staff should enter into negotiations with the City of Santa Fe for back-up supply through the Sangre de Cristo Water System.
2. The CMP must be amended to include recommendations and strategies for future applications which include legal protections, monitoring and mitigation, well location methodology and the public outreach process. The CMP should also address the probability of water supply shortages and system outages and specific timing and phasing of needed back-up supply and production capabilities as water demands increase over time
3. A Citizen Group should be appointed to assist when public concerns or major policy issues related to the CMP arise or as needed.





4. County staff shall immediately assess the potential of aquifer storage and recovery (ASR) or other technologies to address storage of the County's full allotment of water in the BDD project, management of water surpluses, water shortages, water delivery system infrastructure failures, and replenishment of the aquifer. ASR investigations must include evaluating the extent to which the Santa Fe River could be used for groundwater recharge – thus also facilitating the community interest in a flowing Santa Fe River. As appropriate, staff must develop initial plans for implementation of ASR. Any ASR proposal or implementation should be carefully reviewed by the citizen group described in paragraph 3 herein, and vetted through the appropriate public process.

5. Staff shall cooperate with the City of Santa Fe, La Cienega, La Cieneguilla, Agua Fria, Santa Fe Basin Water Association and Eldorado Area Water, Sanitation District and other stakeholders as identified to partner in regional back-up strategies. Collaboration with these entities and the Office the State Engineer to propose Water Right Administration Guidelines for the Santa Fe Basin is a desired outcome.

6. Staff shall regularly monitor the La Cienega/ La Cieneguilla springs as soon as a funding source is identified.

**PASSED, APPROVED AND ADOPTED** this \_\_\_\_\_ day of \_\_\_\_\_, 2011.

**THE BOARD OF COUNTY COMMISSIONERS  
OF SANTA FE COUNTY**

By: \_\_\_\_\_

Virginia Vigil, Chair

**Approved as to Form:**

**ATTEST:**

  
\_\_\_\_\_  
Stephen C. Ross, County Attorney

\_\_\_\_\_  
Valerie Espinoza, County Clerk



**Daniel "Danny" Mayfield**  
*Commissioner, District 1*

**Virginia Vigil**  
*Commissioner, District 2*

**Robert A. Anaya**  
*Commissioner, District 3*



**Kathy Holian**  
*Commissioner, District 4*

**Liz Stefanics**  
*Commissioner, District 5*

**Katherine Miller**  
*County Manager*

## MEMORANDUM

DATE: June 14, 2011

TO: Board of County Commissioners

From: Patricio Guerrerortiz, PE 

VIA: Katherine Miller, County Manager

RE: REQUEST AUTHORIZATION TO PUBLISH TITLE AND GENERAL SUMMARY OF AN ORDINANCE AMENDING SOLID WASTE ORDINANCE 2010-5, TO ADD A NEW 12-TRIP PERMIT.

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### **BACKGROUND AND SUMMARY**

The Commission adopted the 2010-5 Santa Fe County Solid Waste Ordinance on June 8, 2010. The ordinance creates a 24 trip and a single trip permit.

On May 31, 2011, the Board of County Commissioners directed staff to amend the current solid waste ordinance to create a new 12 trip permit for the cost of \$40 per year. This permit will be for residential customers in the County's unincorporated areas. All other provisions in the current ordinance will remain unchanged.

### **ACTION:**

Staff requests authorization to publish title and general summary of amendment to the Santa Fe County Solid Waste Ordinance 2010-5 offering a 12 trip \$40.00 annual permit for unincorporated County residents.





**THE BOARD OF COUNTY COMMISSIONERS OF  
SANTA FE COUNTY**

**ORDINANCE NO. 2011 – \_\_\_\_**

**AN ORDINANCE AMENDING ORDINANCE NO. 2010-5, SECTION 13,  
PARAGRAPHS (A)(1), (A)(2), and (A)(4) TO PROVIDE FOR A 12 TRIP PERMIT  
AND ITS ASSOCIATED FEE FOR RESIDENTS OUTSIDE OF  
INCORPORATED AREAS**

**BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF  
SANTA FE COUNTY THAT SECTION 13, SERVICE FEES, PARAGRAPHS  
(A)(1), (A)(2), and (A)(4) OF ORDINANCE NO. 2010-5 ARE AMENDED BY  
REPLACING THE EXISTING PROVISIONS WITH THE FOLLOWING:**

**Section 13. Service Fees**

(A) Residential Solid Waste Service Fees.

(1) Residential Solid Waste Permits consist of 24 Trip Permits, 12 trip permits and 1 Trip Permits, Recycling Admission Permits and Bag Tags. Residential Solid Waste Permits may only be used to dispose of Residential Solid Waste and Recyclable Materials. Residential Solid Waste Permits are non-refundable and non-transferable. The unauthorized use of a Solid Waste Permit is a violation of this Ordinance, punishable in accordance with Section 12. Residential Solid Waste Permits are valid only during the year printed on the permit. The costs of the permit shall not be pro-rated or discounted based on the month of purchase.

(2) Santa Fe County Residents residing outside of incorporated areas are allowed to purchase the number of 24 Trip Permits, 12 Trip permits, and 1 Trip Permits, Recycling Admission Cards and Bag Tags specified in Section 13(A)(4) of this Ordinance. . . .

. . . (4) Schedule of Residential Solid Waste Permit Fees for Residents Outside of Incorporated Areas.

Permit Type	Solid Waste Accepted	Number of Trips	Fee	Number allotted per year, per dwelling	
24 Trip Permits	All Solid Waste and all sorted Recyclable Materials, subject	24	FY 11 - \$65.00 FY 12 - \$75.00 FY 13 - \$85.00 FY 14 - \$95.00	2	





12 Trip Permits	<p>to the restrictions of this Ordinance and all rules, regulations, and policies promulgated hereunder, including the policies of individual Transfer Stations.</p> <p><u>Special Charges:</u> Four (4) tires will be one (1) additional Trip.</p> <p>Additional Trips will be charged in accordance with the schedules and definitions set forth elsewhere in this Ordinance or in rules, regulations, and policies promulgated hereunder.</p>	12	<p>FY 15 &amp; Thereafter - \$105.00</p> <p>FY 11 - \$40.00  FY 12 - \$45.00  FY 13 - \$50.00  FY 14 - \$55.00  FY 15 &amp; Thereafter - \$60.00</p>	4	
1 Trip Permit	All Solid Waste and all sorted Recyclable Materials, subject to the restrictions of this Ordinance and all rules, regulations, and policies promulgated hereunder, including the policies of individual Transfer Stations.	1	\$15.00	Unlimited	



	<p><u>Special Charges:</u></p> <p>Four (4) tires will be (1) additional Trip.</p> <p>Additional Trips will be charged in accordance with the schedules and definitions set forth elsewhere in this Ordinance or in rules, regulations, and policies promulgated hereunder.</p>				
<b>Recycling Admission Permits</b>	<p>Recyclable Materials Only. Recycling Admission Cards will not be punched for recycling deliveries</p>	Unlimited use for year	Free	Unlimited	
<b>Bag Tags</b>	<p>Each Bag Tag is good for one bag of up to 30 gallons of Solid Waste, subject to the restrictions of this Ordinance and all rules, regulations, and policies promulgated hereunder, including the policies of individual Transfer Stations.</p>	5 tag minimum	\$5.00	Unlimited	





PASSED, APPROVED, AND ENACTED this \_\_\_\_\_ day of \_\_\_\_\_, 2011, by the Board of County Commissioners of Santa Fe County.

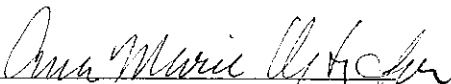
**BOARD OF COUNTY COMMISSIONERS**

\_\_\_\_\_  
Virginia Vigil, Chair

**ATTEST:**

\_\_\_\_\_  
Valerie Espinoza  
Santa Fe County Clerk

**Approved as to form:**

  
\_\_\_\_\_  
Stephen C. Ross, County Attorney

