

# Border Environment Cooperation Commission

## South Central Regional Wastewater Collection and Treatment System Vado, Del Cerro, La Mesa, San Miguel, Berino, and Chamberino Communities in Doña Ana County, New Mexico

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### General Criteria

- 1. Type of Project.** The project consists of construction of a wastewater collection system and wastewater treatment plant to serve six unincorporated communities in Doña Ana County, New Mexico.
- 2. Location of Project.** The communities of Vado, Del Cerro, La Mesa, San Miguel, Berino, and Chamberino are located approximately 13 to 18 miles south-southeast of Las Cruces, New Mexico and 27 miles north of the U.S. - Mexico Border. The project area begins 12 miles south of Las Cruces along Highway 128 and extends to about 10 miles south. The project will serve a 2000 population of 9,140 and a 2020 population of 17,400. It is anticipated these areas will continue to grow at variable rates but generally consistent with the overall border area of 4%-6% in the beginning of the planning period and reduced to 3% by the end of the planning horizon. The following figure illustrates the project area, mainline connections, and treatment plant site.
- 3. Description of Project and Tasks.**

All of the six communities at present do not have any form of wastewater collection and treatment system other than on-site disposal systems. The on-site disposal systems include individual septic tanks with leach fields, or cesspools.

In order to address this lack of wastewater service, the proposed project will include providing service to the residents through 4-inch diameter hook-ups connected directly to each customer's plumbing system. The wastewater will be collected by a conventional gravity sewer system from all six communities and conveyed through a forcemain located at varying distances to the wastewater treatment plant located in approximately the center of the planning area. The proposed wastewater treatment system includes an activated sludge type treatment process (sequencing batch reactor), ultraviolet disinfection to treat a volume of 1.05 mgd, which will be expanded in a second phase in the year 2009 to 2.1 mgd to meet 2020 demands. The treated effluent from the wastewater treatment facility will be discharged to the Rio Grande and meet the NPDES (National Pollutant Discharge Elimination System) standards of less than 30 mg/l of biochemical oxygen demand, 30 mg/l of total suspended solids, 20 mg/l of nitrogen, and 500 organisms/100 ml of total coliform.

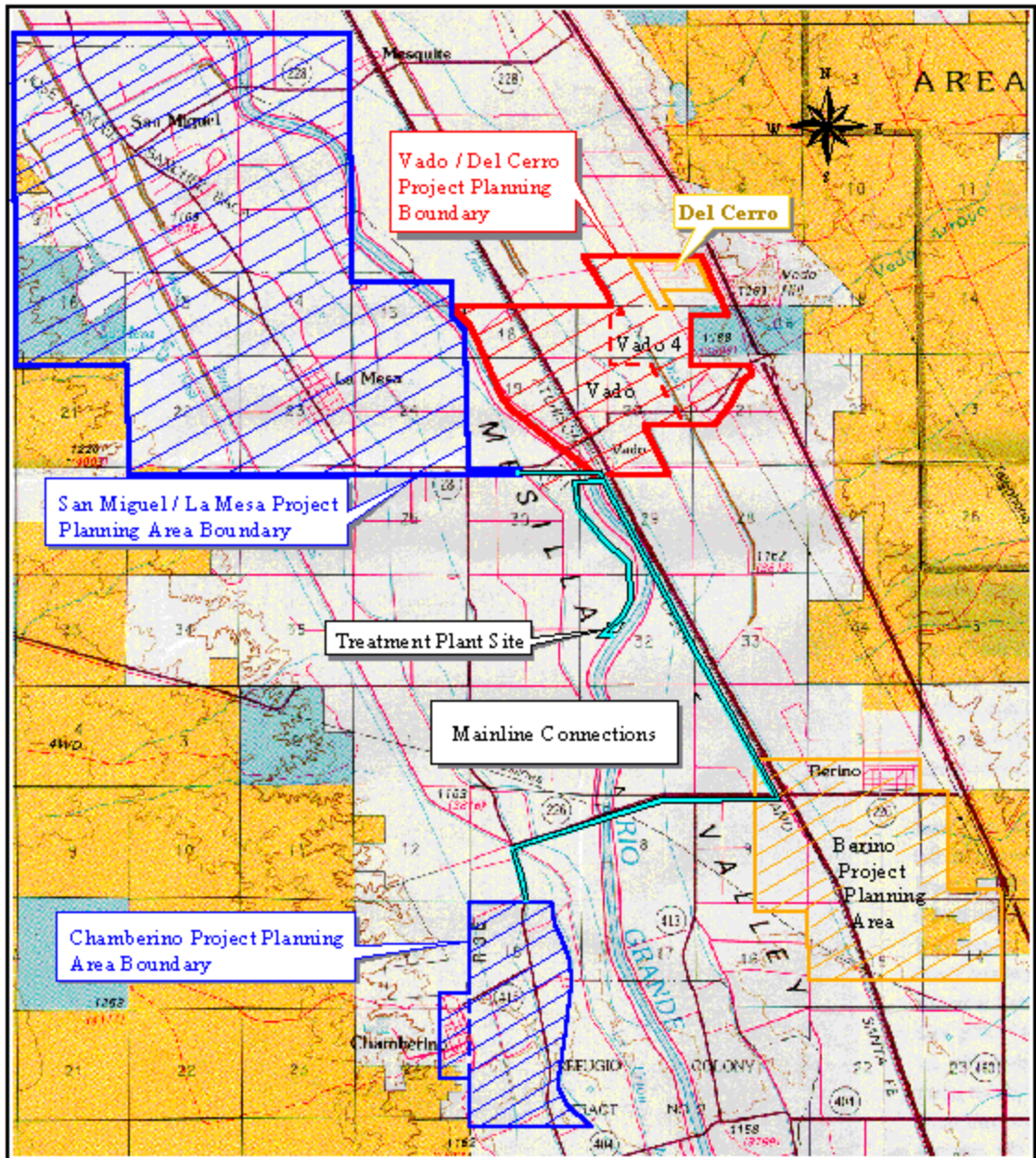


Figure 1-2 Project Planning Area Vicinity Map  
South Central Regional Wastewater System

Note: Numbers within black outlined squares are section numbers. Each section encloses approximately 640 acres, or one square mile.



Prepared by  
Taschek Environmental Consulting  
Basemap Data  
Bureau of Land Management  
Las Cruces 1:100,000 Land Status Map

The wastewater sludge will be transported to the solid waste landfill located west of Las

Cruces after proper treatment, which includes aerobic digestion and mechanical dewatering. Additionally, the standard per capita wastewater flow for residential of 85 gallons per capita was used.

A summary of the components are addressed below:

Collection and Conveyance System:

- 301,800 lf PVC gravity sewer line and corresponding manholes
  - 93,000 lf for Vado and Del Cerro
  - 163,000 lf for La Mesa and San Miguel
  - 26,000 lf for Berino
  - 19,000 lf for Chamberino
- 20 lift stations
- 78,100 lf of 8 to 16-inch forcemains
- 2,200 hook-ups

Treatment System (2.1 MGD)

- Headworks with Bar Screen and Grit Removal
- Phase I Sequencing Batch Reactor with a capacity of 1.05 MGD
  - 2 SBR Basins
- Phase II Sequencing Batch Reactor with a capacity of 1.05 MGD
  - 2 SBR Basins
- Aerobic Digester
- 10 Acres of Land

Effluent Disposal System:

- One UV disinfections unit
- 400 lf of 24-inch diameter gravity discharge line to Rio Grande

Sludge Disposal System:

- Aerobic Digestion with Belt Press Mechanical Dewatering

- 4. Compliance with international Treaties and Agreements.** The project sponsor submitted a statement that the project complies with the rights and obligations established in applicable treaties and agreements

## **Human Health and Environment**

**1. Human Health and Environment.** Rapid, unplanned urban growth has occurred in much of the South Central region. Growth and construction in the area is essentially unregulated. Vado, Del Cerro, the surrounding area - termed Vado 4, La Mesa, San Miguel, Berino, and Chamberino have been designated as colonias by Doña Ana County. The current poor conditions of this area are expected to get worse as the unchecked expansion continues.

Many of the residential lots are landlocked, and some contain five or six mobile homes on one acre. Wastewater is treated by on-site systems including septic tanks and cesspools. The density of septic tanks and cesspools is increasingly rapid. Field observation indicates that some sewage is allowed to run into the ground with no treatment.

Because of the shallow groundwater table (five to ten feet below the surface), there exists a greater potential for groundwater contamination. Furthermore, the high density of homes combined with a prominent layer of poorly draining soil causes frequent surfacing of contaminated water and is an immediate threat to public health. Rodents and insects are attracted into the area, and children who enjoy playing in water puddles after rainstorms can stray into contaminated water. The intent of this project is to address the existing threat to public health and groundwater contamination, and to avoid such threats in the future.

Hepatitis A is a liver disease associated with unsanitary disposal of sewage and inadequate or contaminated water supplies. The incidence rate of Hepatitis A for Dona Ana County was 36.2 cases per 100,000 persons in 1997, which is over 79% higher than for the State of New Mexico. The baseline value in 1994 for Hepatitis A was 16 cases per 100,000 persons in New Mexico. In addition, the number of cases of Shigella in Dona Ana County is 12% higher than for the rest of the State. Shigellosis often results from poor sanitation, lack of water/wastewater facilities, contaminated water and food and is common in colonias areas.

**2. Environmental Assessment.** Previously, the Facilities Plan documents prepared for each community in 1994 were approved and Findings of No Significant Impact (FONSI) were issued for Vado/Del Cerro, La Mesa/San Miguel, and Berino. These Facility Plans recommended wastewater treatment plants for each community. Regionalization of the treatment facility and relocation of the treatment site required revision of the Facilities Plans. The New Mexico Environment Department (NMED) and Taschek Environmental Consulting completed a new Environmental Information Document (EID) of the new, regional treatment facility site and produced a draft Environmental Assessment (EA) for the entire South Central Regional system which includes all six communities of Vado, Del Cerro, La Mesa, San Miguel, Berino, and Chamberino. This draft EA was submitted jointly by NMED/Dona Ana County to EPA at the end of March 2001. It is anticipated that a FONSI for the South Central Wastewater System will be issued by early May 2001. The EA and FONSI will be available for public review and comment through early June 2001.

**3. Compliance with Environmental and Cultural Resources Law and Regulations.** As part of the environmental review, the EID considered any and all crosscutting environmental and cultural/historical laws, Executive Orders and regulations, including among others, Significant, Unique or Important Farmlands, National Natural Landmarks, Wilderness Protection, Wild and Scenic Rivers, Wetlands Protection, Floodplain Management, Fish and Wildlife Protection, Endangered Species Protection, Historical, Architectural, Archeological, and Cultural Sites, Air Quality, and Environmental Justice. The project is in compliance with all applicable environmental and cultural resource laws and regulations, assuming all future consultation, mitigation, and observance of restrictions are followed. In the development of environmental documentation for this project, an Archeological Survey and a Biological Assessment were completed for the project area.

A Class III (100%) ground coverage archeological survey was conducted in January 2000. Only one artifact, a piece of historic glass, was recorded during the survey. No impacts to cultural resources are anticipated as a result of this project. The complete archaeological report has been submitted to the State Historic Preservation Officer for review and concurrence. In addition, the new Section 106 regulations for Native American/Tribal consultation have been concluded. No issues of concern were raised by the Mescalero Apache.

A Threatened and Endangered Species Survey (TES) was completed in January 2000. Although a wide range of threatened and endangered species could potentially occur within the project area, only a loggerhead shrike (a candidate for listing for threatened status with USF&W) was observed during this field survey. The project is not expected to have any significant impact on threatened or endangered species in the area.

## **Technical Feasibility**

### **1. Appropriate Technology.**

In 1994, Doña Ana County through a New Mexico Environment Department completed four wastewater facilities plans for these six communities. At such time Vado and Del Cerro were grouped together and La Mesa and San Miguel were as well. These facility plans recommended

four wastewater treatment plants. In 1999, through the BECC technical assistance program, several studies were completed which concluded that it would be more cost-effective to have regional wastewater treatment facility that would treat all of the flow for the six communities. Additionally a study for selection of the site was completed which included the evaluation of seven sites. Each of these studies included a planning horizon of 20 years and completed the following alternative analysis:

- Wastewater Collection Alternatives: Four alternatives were analyzed which include the small-diameter variable-slope sewers, vacuum sewer system, pressure grinder pump system, and the selected alternative of a conventional gravity system.
- Wastewater Treatment Alternatives: Five alternatives were analyzed which include an oxidation ditch system, trickling filter system, contact stabilization system, wetlands facility, and the selected alternative of the activated sludge utilizing a sequencing batch reactor configuration.
- Disinfection: Three alternatives were analyzed which include gas chlorination, on-site generation of chlorine, and the selected alternative of ultra-violet disinfection.
- Effluent Disposal Alternatives: Three effluent disposal alternatives were analyzed which include a surface irrigation, wetlands disposal and the selected alternative of discharge to the Rio Grande.
- Sludge Management: four dewatering alternatives were analyzed which include three types of drying beds and the selected alternative of mechanical dewatering.
- Site for WWTP: Seven sites were analyzed.

The alternatives discussed above were ranked based on reliability, reduction of energy use, water supply implication, process complexity and appropriateness, environmental impacts, and implementability. The selected alternative and the best alternative was selected used on a combination of these criteria, lowest initial investment and lowest operation and maintenance cost during the planning period. Additionally, the owner of the site for the wastewater treatment plant is a willing seller.

- 2. Operation and Maintenance Plan.** New Mexico Environment Department requires that a project plan of operation be prepared during the construction phase as well as an O&M manual for the lift station and wastewater treatment plant. After approval of the manuals an operator training course will be conducted as the facility is coming on-line. Additionally, a monitoring period of one year is required; quarterly project performance reports will be completed.
- 3. Compliance with applicable design norms and regulations.** This project is compliance with applicable design standards and regulations, which are required, by the New Mexico Water Quality Control Commission and NMED Groundwater Bureau.

## **Financial Feasibility and Project Management**

### **1. Financial Feasibility.**

The project has a total project cost of \$28,421,700, which includes \$3,300,000 for hookups and \$1,900,200 for expansion of the wastewater treatment plant in 2009. The following table illustrates the details of the estimated project cost.

ITEM	Total Project	PROJECT AREA			
		Vado/ Del Cerro	La Mesa/ San Miguel	Berino	Chamberino <sup>a</sup>
Collection (lf)	301,000	93,000	163,000	26,000	19,000
Conveyance (lf)	78,100	16,000	11,100	24,000	27,000
Lift Stations	Aprox 20	7	Aprox 12	1	2
Initial Phase Treatment Capacity (mgd)		1.05	Included in Vado/Del Cerro	Included in Vado/Del Cerro	Included in Vado/Del Cerro
Phase 1 Treatment Capacity (mgd)		2.1			
<b>Planning Phase</b>					
Facility Planning	\$547,800	\$173,500	\$224,300	\$93,800	\$56,200
NMGRT@5.8125%	\$31,800	\$10,000	\$13,000	\$5,500	\$3,300
<b>Total Planning Phase</b>	\$579,600	\$183,500	\$237,300	\$99,300	\$59,500
<b>Initial Phase (Existing Need) - Collection, Conveyance, Treatment, and Hook-Up Construction</b>					
Collection	\$11,138,000	\$3,245,000	\$4,339,000	\$1,840,000	\$1,714,000
Conveyance (incl. Lift Stations)	\$2,820,000	\$250,000	\$491,000	\$725,000	\$1,354,000
Treatment	\$2,717,800	\$2,717,800	NA	NA	NA
Total Construction	\$16,675,800	\$6,212,800	\$4,830,000	\$2,565,000	\$3,068,000
Engineering/Management	\$2,467,000	\$1,019,100	\$555,900	\$391,800	\$500,200
Land Acquisition	\$310,000	\$110,000	\$50,000	\$70,000	\$80,000
Contingency	\$1,945,300	\$734,600	\$543,600	\$302,700	\$364,800
Taxes	\$1,243,800	\$469,400	\$347,600	\$193,500	\$233,300
<b>Subtotal:</b>	\$22,641,900	\$8,545,500	\$6,627,100	\$3,523,000	\$4,246,300
Hook-Up Costs	\$3,300,000	\$1,500,000	\$1,140,000	\$420,000	\$240,000
<b>Total Initial Phase:</b>	\$25,941,900	\$10,045,500	\$7,467,100	\$3,943,000	\$4,486,300
<b>Phase 1 - Wastewater Treatment Plant Expansion</b>					
Construction	\$1,500,000	\$1,500,000			
Engineering/Management	\$150,000	\$150,000			
Land Acquisition	\$0	\$0			
Contingency	\$145,800	\$145,800	\$0	\$0	\$0
Taxes	\$104,400	\$104,400	\$0	\$0	\$0
<b>Total Phase 1</b>	\$1,900,200	\$1,900,200	\$0	\$0	\$0
<b>TOTAL ALL PHASES:</b>	<b>\$28,421,700</b>	<b>\$12,129,200</b>	<b>\$7,704,400</b>	<b>\$4,042,300</b>	<b>\$4,545,800</b>

The project has received \$12.5M in funding from BECC for facility planning and final design and New Mexico Environment Department through the EPA funded Colonias Program for construction. The remaining unfunded portion of \$16.0M will be funded through a combination of BEIF, rate structure, and loan funds. Additionally, in order to maintain the proposed rate structure transition assistance of \$838,544 is also included. The following table summarizes the financial structure of the project.

ITEM	Total Project Costs	PROJECT FUNDING			
		USEPA Colonias (Grant)	BECC TA Funds (Grant)	NM State Revolving Loan Fund (Loan)	BEIF Funds (Grant)
Planning Phase					
Facility Planning	<u>\$579,600</u>	<u>\$367,500</u>	<u>\$212,100</u>	<u>\$0</u>	<u>\$0</u>
<b>Total Planning Phase</b>	\$579,600	\$367,500	\$212,100	\$0	\$0
<b>Initial Phase (Existing Need)</b>					
Engineering/Management (through bidding)	\$2,871,534	\$2,070,534	\$800,900	\$0	\$0
Construction, land, contingency, and taxes	<u>\$19,770,466</u>	<u>\$9,050,566</u>	<u>\$0</u>	<u>\$2,800,000</u>	<u>\$7,919,900</u>
<i>Subtotal</i>	\$22,641,900	\$11,121,100	\$800,900	\$2,800,000	\$7,919,900
Hook-Up Construction	<u>\$3,300,000</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$3,300,000</u>
<i>Total Initial Phase w/Hook-ups</i>	\$25,941,900	\$11,121,100	\$800,900	\$2,800,000	\$11,219,900
<b>TOTAL (Including Planning)</b>	<b>\$26,521,500</b>	<b>\$11,488,600</b>	<b>\$1,013,000</b>	<b>\$2,800,000</b>	<b>\$11,219,900</b>
<b>Phase 1 <input type="checkbox"/> WWTP Expansion</b>					
Engineering/Management	\$150,000				
Construction, contingency, taxes	<u>\$1,750,200</u>				<i>To Be Determined</i>
<b>Total Phase 1</b>	\$1,900,200				
<b>TOTAL ALL PHASES</b>	<b>\$28,421,700</b>	<b>\$11,488,600</b>	<b>\$1,013,000</b>	<b>\$2,800,000</b>	<b>\$11,219,900</b>
<b>Transition Funds</b>	\$838,544	\$0	\$0	\$0	\$838,544

**2. Rate Model:** There are currently no wastewater facilities serving this area and therefore no historic fee/rate schedules. The financial model shows an initial user fee of \$21.00 per residential connection per month, billed as a fixed rate. It is anticipated that the user fees will initiate in FY 2002. In FY 2005 the user fee will be increased to \$22.00, in FY 2007 to \$23.00 and in FY 2008 to \$24.00. The financial model also illustrates in each year revenues are sufficient to offset expenses, with the cumulative total funds from all sources building each year. Included in the expenses is a repair/replacement line item that builds at a rate of 10 to 20% of the total operations and maintenance expenses for that year. The percentage increases as the utility ages.

**3 Project Management.** Organizationally, the utility will be managed by County staff and operated by one or more contract operations companies. Initially, the County utility staff will include a Utility Administrator, Assistant Utility Administrator, Financial Specialist, General Foreman, Utility Operations, Senior Secretary/Administrative Assistant, Customer Service Manager, and Project Manager. Key support personnel will include field coordinator and various field personnel. Other support will come from personnel in various County departments.

## Public Participation

- 1. Comprehensive Public Participation Plan.** The objectives of the Comprehensive Public Participation Plan (Plan) are to ensure that the community understands and supports the environmental, health, social, and financial benefits and costs of the project, as well as any changes in user fees. Such Plan includes the following elements required for certification in public participation: development of a steering committee, meeting local organizations, development of a public information campaign, and public meetings. The activities carried out thus far related to this Plan are summarized below.
- 2. Steering Committee:** Three steering committees were formed for this project. One committee was formed for the colonias of Vado, Del Cerro, San Miguel and La Mesa. Other committees were formed in Chamberino and Berino. This last steering committee was reactivated from the Berino project certified in 1998. The committees participated in the development of the public outreach campaign and public meetings. These committees met sixteen times to follow up on the public process.
- 3. Local Organizations:** Meetings were held with a several local organizations to present the project and solicit support for and understanding of the project. These organizations include: Colonias Development Council; the Vado, Mesquite, Alto de las Flores, La Mesa, Berino, and Desert Sands Mutual Domestic Water Consumers Associations; Berino Mutual Sewage Works Association; Anthony Water and Sanitation District; Chamberino Water Board; Tierra del Sol; Border Health Office; Gadsden Independent School District; La Clinica de la Familia; International Boundary and Water Commission; Southwest Environmental Group; Rural Community Assistance Foundation and Elephant Butte Irrigation District
- 4. Public Information:** Project information, such as the Facility Plan and project fact sheets were available in several locations throughout the colonias, such as the Mutual Domestic; Post Offices, local Churches; Senior Centers; Health Centers; and Fire Stations. Other outreach methods were determined by each steering committee that included mailers, flyers, neighbor meetings, door to door notification of the public meetings and poster signs were posted at frequently used areas. Notices for public meetings were posted in Las Cruces Sun News, in the water bills and local television.
- 5. Public Meetings:** From April 1999 to January 2001 ten public meetings were held, in addition to County Commissioners public meetings. Several of them were held in conjunction with NEPA required meetings. In the final public meeting that took place on January 31, 2001 96% of those surveyed supported the project and proposed rate structure.

## Sustainable Development

- 1. Definition and Principles** The proposed project complies with BECC's definition of Sustainable Development: *Conservation oriented social and economic development that emphasizes the protection and sustainable use of resources, while addressing both current and future needs, and present and future impact of human actions.*

The project is in general compliance with the definition as follows:

- Social impacts are positive because the colonia properties are added to the tax base of the area, allowing for increased social services and improvements to schools.
- It has a positive economic impact because it will strengthen property values. Increased value will mean better chances for homeowners to access credit, improve their lives, and increase their net worth.



- It improves the impact of current human activity on the environment while at the same time eliminating further degradation to the environment.
- It has been developed with protections for water resources, floodplains, cultural resources, and threatened, endangered and protected species.
- It addresses current need for services in the rural communities outside of the city limits, and incorporates modest historical expectations for growth. Future growth can be managed and regulated by the county-wide wastewater utility.

Principle 1: The project is centered on the needs of the residents of the communities of Vado, Del Cerro, La Mesa, San Miguel, Berino and Chamberino, in Dona Ana County, New Mexico.

Principle 2: The rights of the residents to adequately raise their standard of living and develop their properties are recognized and underlie the reasons for undertaking the project.

Principle 3: Environmental protection is integral to the project.

Principle 4: Stakeholders have been involved and have had the opportunity to participate in the decision-making process. This not only includes the local residents, but also local, regional, state, and federal agencies with statutory interest and standing in the issues at hand.

- 2. Institutional and Human Capacity Building.** This project is one of several in the southern New Mexico region and is a component of the County's commitment to regional planning. This is a significant development in the planning necessary to successfully address emerging infrastructure needs and is a basic component of sustainable development. Dona Ana County has begun the process of strengthening its institutional infrastructure. A significant amount of technical and managerial training and development will be directed into the area. Operations and personnel will receive extensive training on equipment and environmental issues.
- 3. Conformance with Applicable Local/Regional Conservation and Development Plans.**

The project conforms to the following local and regional plans:

- Dona Ana County Comprehensive Plan, 1994
- Dona Ana County Wastewater Facilities Plan, 1997
- Dona Ana County Resolution 96-36, passed May 14, 1996

- 4. Conservation of Natural Resources.**

The project will eliminate the inadequate on-site wastewater disposal systems currently used in the project area as sources of potential ground and surface water contamination. Protection of the Rio Grande as a source of water for neighbors to the south, including El Paso, is enhanced. The County is developing a series of comprehensive ordinances to address statutory requirements of the Clean Water Act and its related laws. These ordinances have been drafted and are structured on EPA model ordinances.

Dona Ana County participates in local and regional water conservation programs and efforts. The County's leadership is committed to developing water conservation goals and policies as part of its water management program. Reuse alternatives have been considered in planning for all facility development. Appropriate alternatives will be implemented to support each facility's capacity and water management program goals. Also, it is recognized that legal/institutional capacities and economic incentives must exist if water users are to significantly conserve water. Dona Ana County is committed to developing these policies and assisting the community water providers for similar policy development.

- 5. Community Development.**

Through the development of this project and the close working relationships developed with the community members, individuals have realized the importance of addressing

environmental issues as a community. This has fostered and strengthened the existing community groups, empowering them to take action on their own behalf. A number of private nonprofit agencies and task forces have banded together to advocate infrastructure development in the unincorporated colonias areas. The Colonias Development Council, an independent community organization of over 15 government and private agencies, has applied for a grant from the U.S. Department of Housing and Urban Development. By providing the integral infrastructure of sewer collection and treatment, the planning area will appear more attractive and inexpensive for new community services, such as schools, churches, and recreational facilities, encouraging them to move into the area.

### **List of Documents**

1. Leedshill Herkenhoff, Inc., *Chamberino Wastewater Facility Plan*, Doña Ana County, New Mexico, Vol. I & II , October 1996
2. Molzen-Corbin & Associates, *Berino and Montana Vista Wastewater Facilities Plan Amendment to Berino Wastewater Facility Plan*, September 1998.
3. Molzen-Corbin & Associates, *Berino and Montana Vista Wastewater Facilities Plan Amendment No. 2 to Berino Wastewater Facilities Plan*, January, 2001.
4. Souder, Miller & Associates, *Revised Facility Plan & Environmental Information Document for the La Mesa/San Miguel Wastewater Project*, October 2000.
5. Wilson & Company, *Wastewater Collection System for Vado/Del Cerro and Wastewater Treatment Facilities for Vado/Del Cerro/La Mesa/San Miguel*, March 2000.
6. Taschek Environmental Consulting, *Environmental Information Document for the South Central Regional Wastewater Treatment System, Doña Ana County, New Mexico*.
7. Taschek Environmental Consulting, *Endangered Species and General Biological Survey Report, South Central Regional Wastewater Treatment System*, January 2001.
8. Taschek Environmental Consulting, *A Cultural Resource Survey of Proposed Location for a Wastewater Treatment Plant, Discharge Area, and Force Main Line, and a Reconnaissance of Historic Period Buildings in the Communities of Vado/Del Cerro, Berino, Chamberino, La Mesa, and San Miguel, Doña Ana County, New Mexico*, January, 2001.