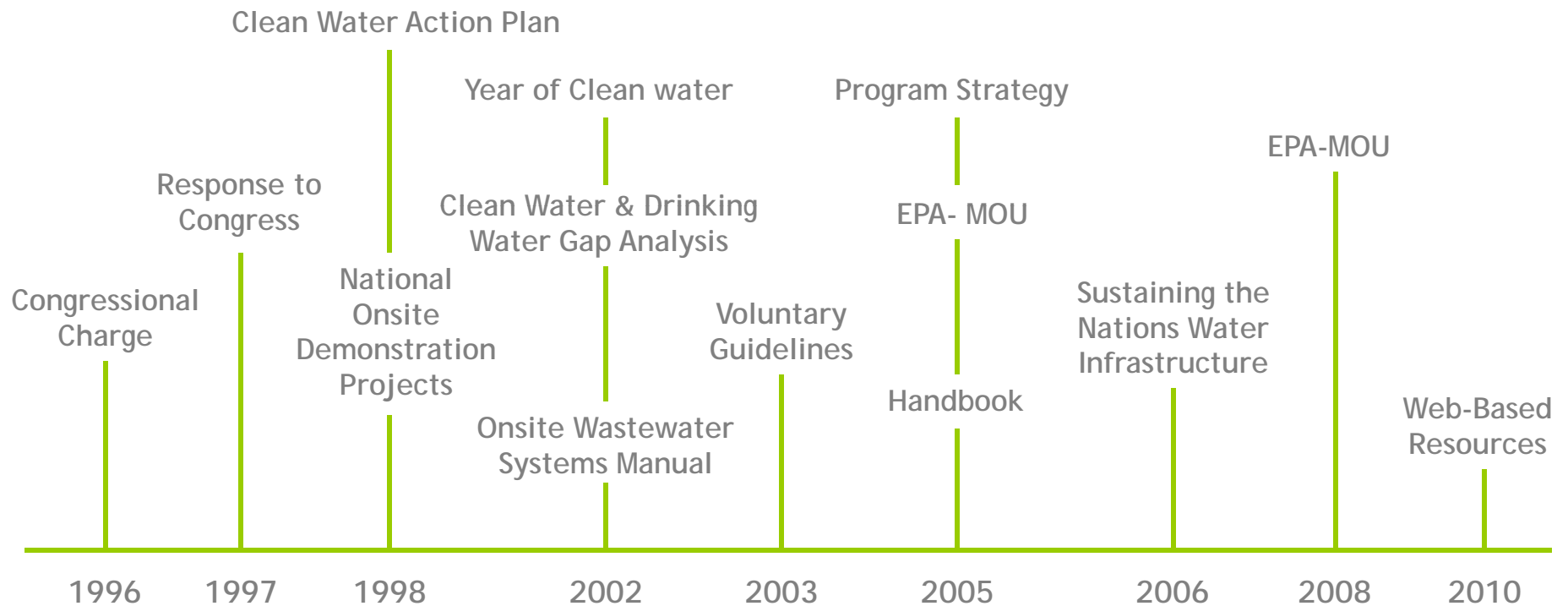


Innovations in Rural Wastewater Management
Decentralized Approach
Toward Sustainable Water Infrastructure Management

Setting the Stage



Congressional Focus

- Ability of decentralized systems to efficiently utilize limited funding for wastewater infrastructure
- Appropriateness of decentralized systems as an alternative to centralized treatment
- Implementation of alternatives approaches



Response to Congress

- Decentralized systems can protect public health and the environment
- Typically have lower capital and maintenance costs for rural communities



Response to Congress

- **Appropriate** for varying site conditions
- Suitable for ecologically sensitive areas **when adequately managed**



Conclusion

- When **properly managed** decentralized wastewater treatment systems do provide adequate protection of public health and environmental quality



Demonstration Projects

- Encouraging the use of alternative, onsite and wastewater treatment technologies to protect public health, ensure water quality, and sustain the environment
- Integrating appropriate technologies with sustainable management approaches



Clean Water Action Plan

- Ensure implementation of the Clean Water Act goals

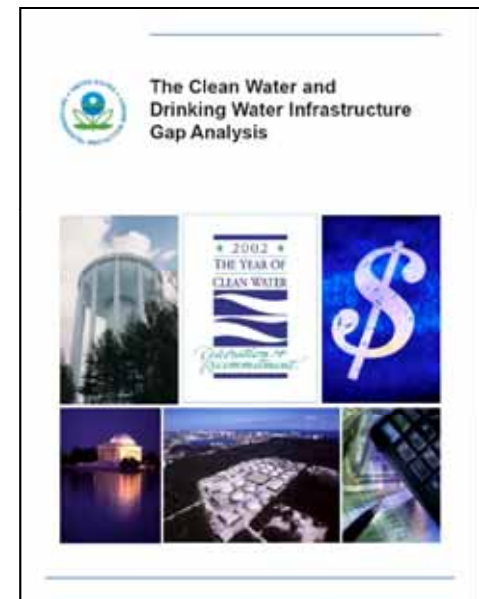


Year of Clean Water



Gap Analysis

- If capital investment and operations and maintenance remained at current levels, the potential funding shortfall for drinking water and wastewater infrastructure could exceed \$500 billion by 2020



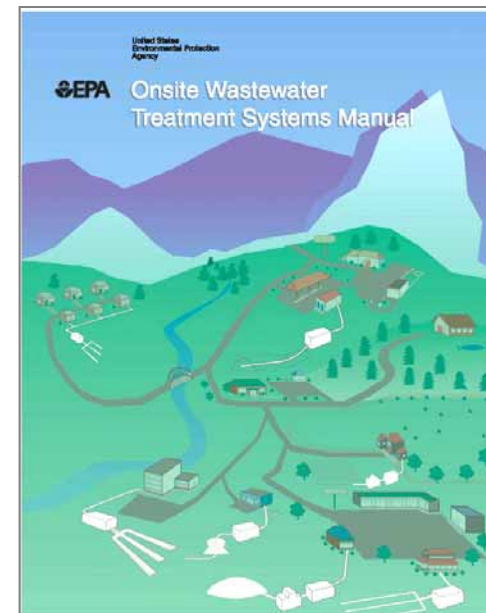
Gap Analysis

- Drinking water and wastewater systems will need to use a combination of increased investment and innovative management practices and technologies to close this gap



Onsite Systems Manual

- Treatment technologies
- System design
- Long-term system management
- Focus on onsite wastewater treatment and onsite system management



Voluntary Guidelines

- Comprehensive life cycle management strategy for onsite/decentralized systems



Factors for Consideration

Environmental Sensitivity

Public Health

Wastewater Characteristics

Treatment Complexity

Cost-Benefit

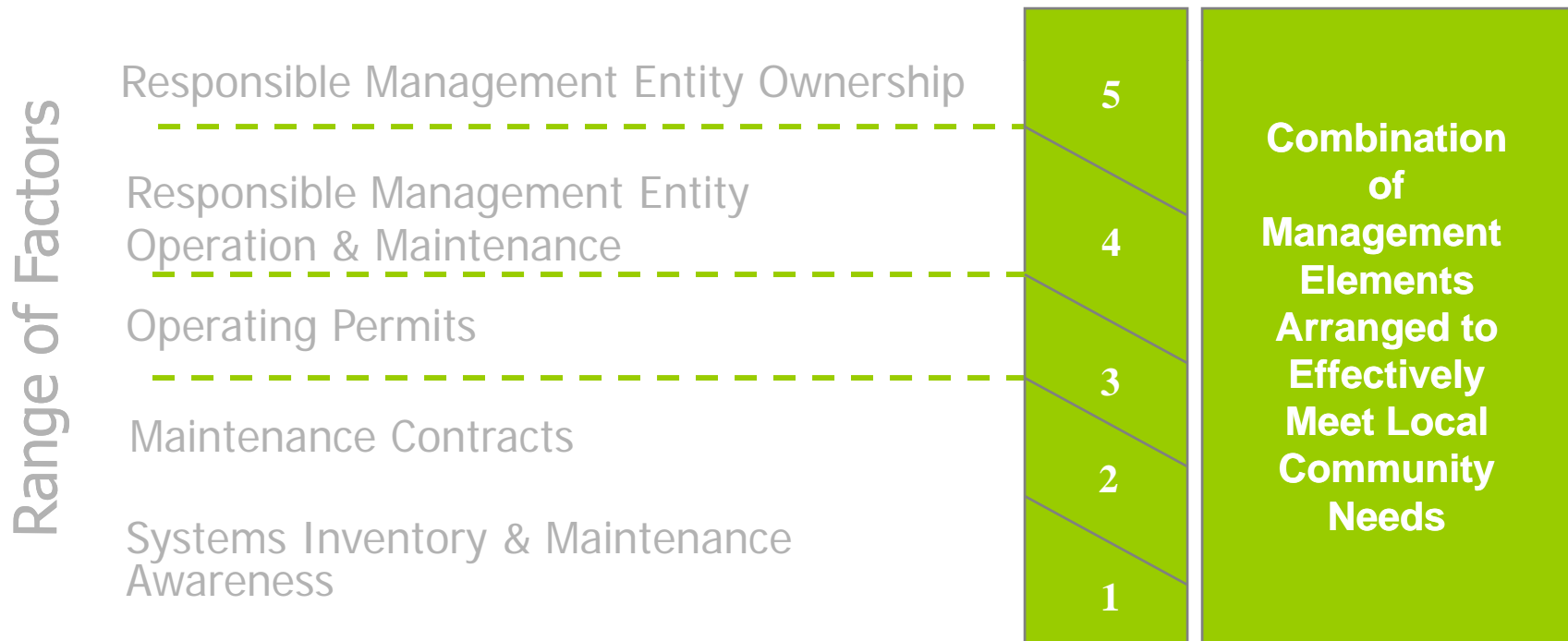
Political Landscape

Management arrangements



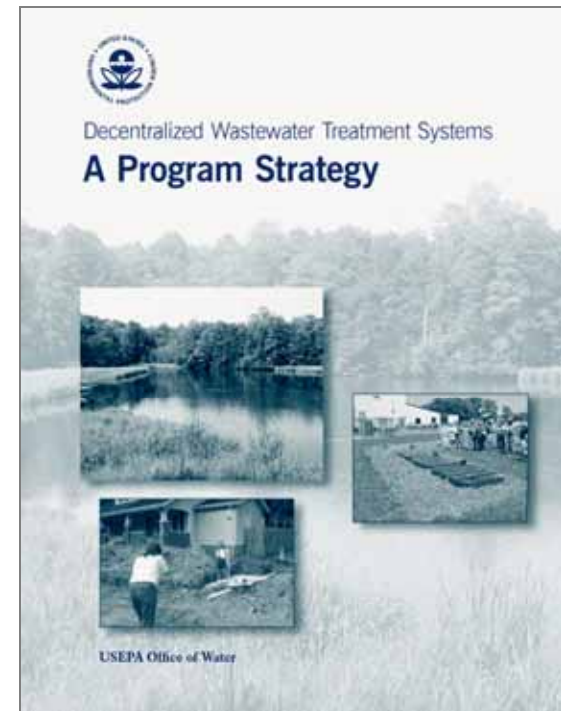
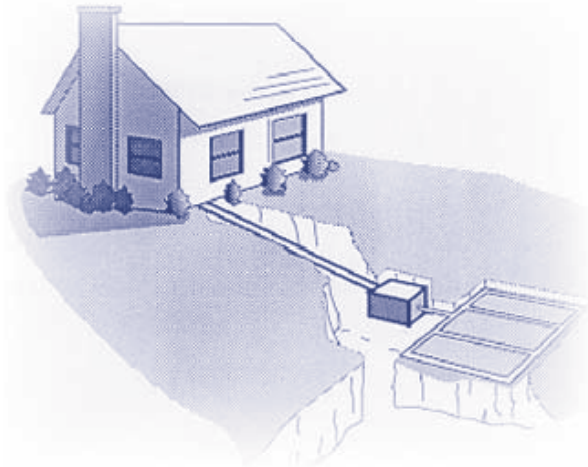
Management Arrangements

Community Considerations



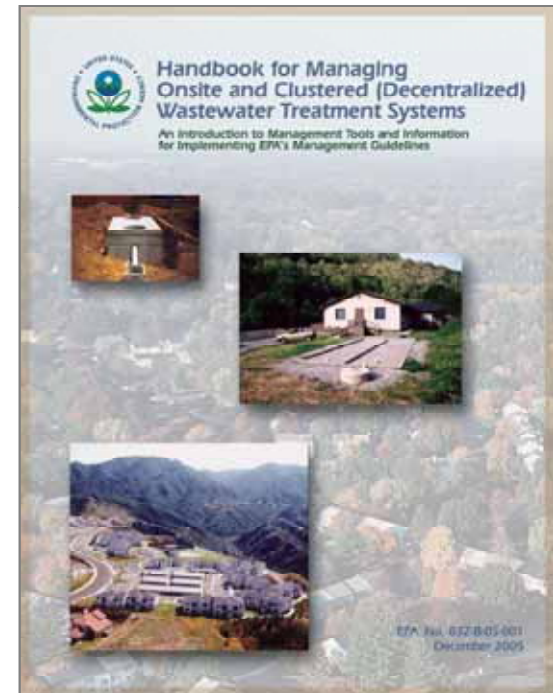
Program Strategy

- Improving the performance of decentralized wastewater treatment systems



Handbook

- Step-by-step, how-to guide to assist communities in implementing the *Voluntary Guidelines*



Ten Years On (1996-2006)

- Continuing lack of awareness about system maintenance requirements
- Ongoing public misperceptions a propos system performance and capability
- Legal and regulatory constraints



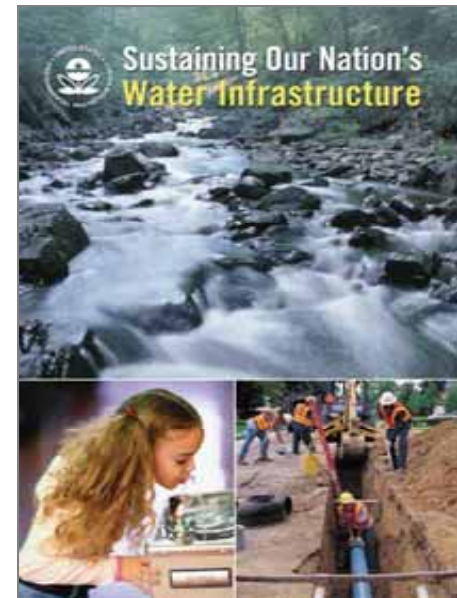
Ten Years On (1996-2006)

- Ongoing need for management
- Continuing liability fears
- Financial disincentives and financial constraints



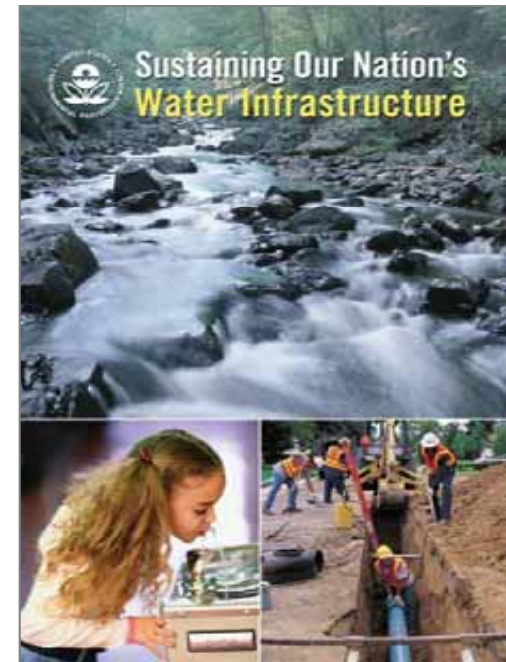
Sustaining Water Infrastructure

- Collaborative approach to help ensure that our nation's water infrastructure is sustainable in the future



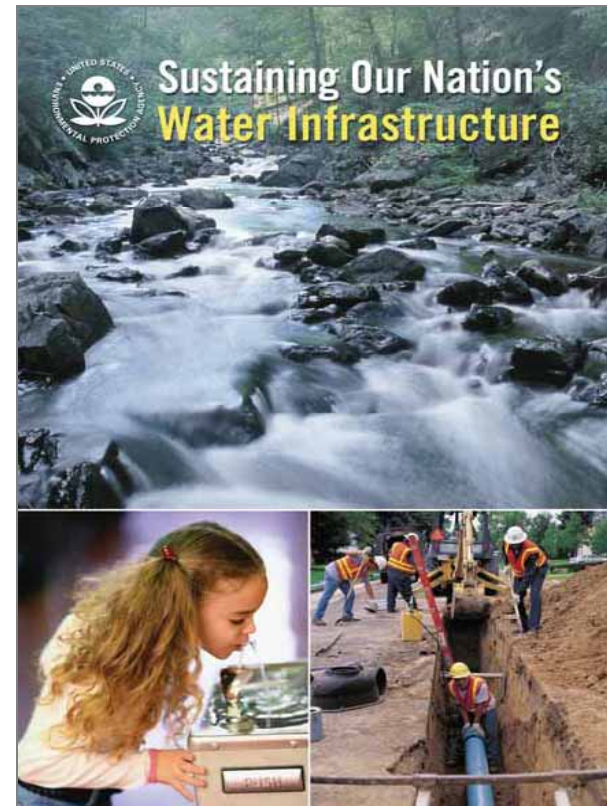
Sustaining Water Infrastructure

- Advocating and sharing information on best practices, tools, innovative technologies, and research and development breakthroughs



Sustaining Water Infrastructure

- An effort to change the way the nation views and manages its water infrastructure



Four Pillars

- Better Management
- Full Cost Pricing
- Water Efficiency
- **Watershed Approach**



Watershed Approach

- Encouraging adoption of watershed management principles and tools into utility planning and management practices



Watershed Approach

Watershed Approach

Decentralized Wastewater Management



Management Continuum

Individual Ownership

Personal Accountability & Responsibility
for the Ongoing Regulatory Compliance,
Maintenance & System Integrity



Institutional Ownership

Accountability, Responsibility for
Regulatory Compliance Ongoing
Maintenance System Integrity
Life-Cycle Management

1

2

3

4

5

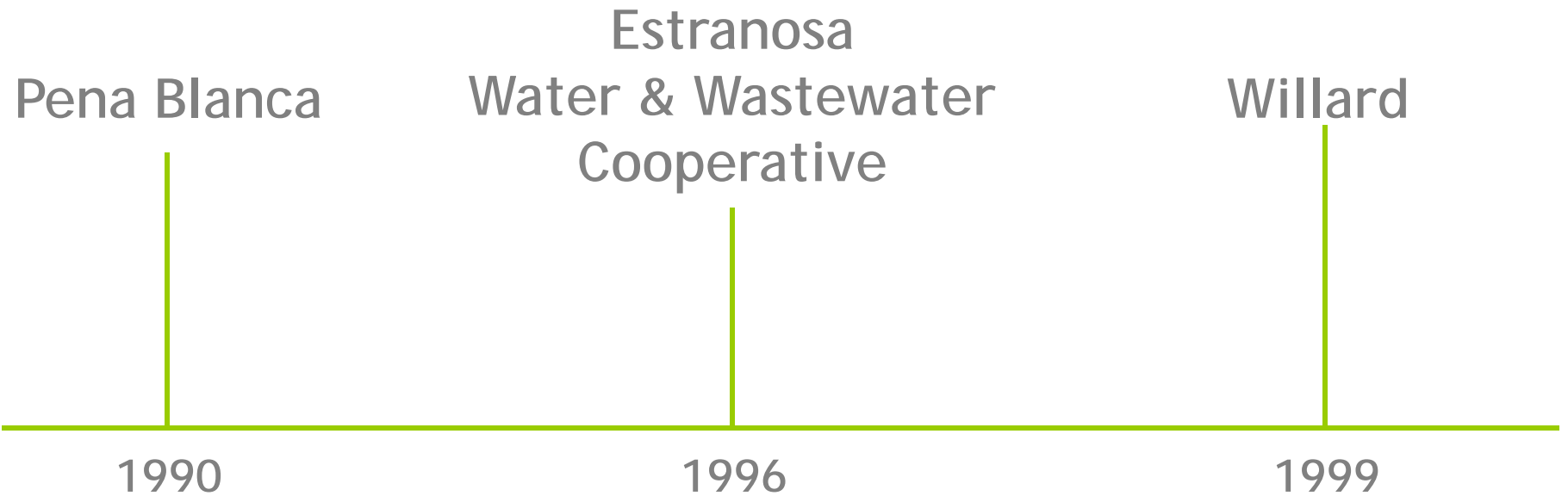
ME

Management Continuum

RME



Community Initiatives



Pena Blanca

- Driving Forces
- Actions
- Outcomes



Driving Forces

- On-site decentralized system failures
- Potential public health challenges
- Multiple residences served by a common, overloaded, system
- Affected of high groundwater on systems
- Inadequate leach-fields



Recommendations

- Small diameter pressure collection system and facultative ponds with intermittent sand filters
- Estimated cost of \$3.1 million
- Anticipated connection cost \$18,300 or \$16,800 per 1,000 gallons of waste treated
- Insufficient funds



Recommendations

- Utilize on-site wastewater treatment systems
- Install septic tank leach-fields, cluster systems, and sand mound disposal systems
- Estimated construction cost of \$1.2 million



Actions

- 133 on-site systems installed at a total cost of \$939,700



Outcomes

- Water and Sanitation District (WSD) designated as lead agency
- Responsible for maintaining the systems to ensure proper operation



Outcomes

- Biannual pumping services for a monthly fee of \$10.64 for a 1,000 gallon tank
- Sampling of private wells in the area found nitrate nitrogen levels below 1 mg/l.



Estranosa

- Driving Forces
- Actions
- Outcomes



Driving Force

- Protect groundwater



Recommendations

- Initiate a septic tank management program



Actions

- Provide certified operators to wastewater treatment facilities being constructed for large subdivisions
- Institute a voluntary program to provide discounted septic tank pumping at a three year interval
- Revise bylaws to make the program mandatory for all new and transfer memberships



Outcomes

- First membership organization to institute a septic tank maintenance program
- Provides service to an area approximately 20 miles east of the City of Albuquerque, known as the East Mountain Area (EMA)



Outcomes

- Initially about 70 members signed up for the voluntary program at a cost of \$5.00 per month
- By 2005, over 1100 households were served by the septic tank pumping program and the rate increased to \$5.50 per month



Willard

- Driving Forces
- Actions
- Outcomes



Driving Forces

- Lack of adequate septic tanks
- Surface contamination
- Rising levels of nitrates in the village communal well



Recommendations

- Demonstrate the viability of the centralized management of affordable, decentralized wastewater systems within New Mexico



Actions

- Provide higher levels of treatment by linking conventional septic tanks to re-circulating textile media filters
- Village took administrative and legal steps to operate the system



Outcomes

- Centralized management of decentralized systems



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