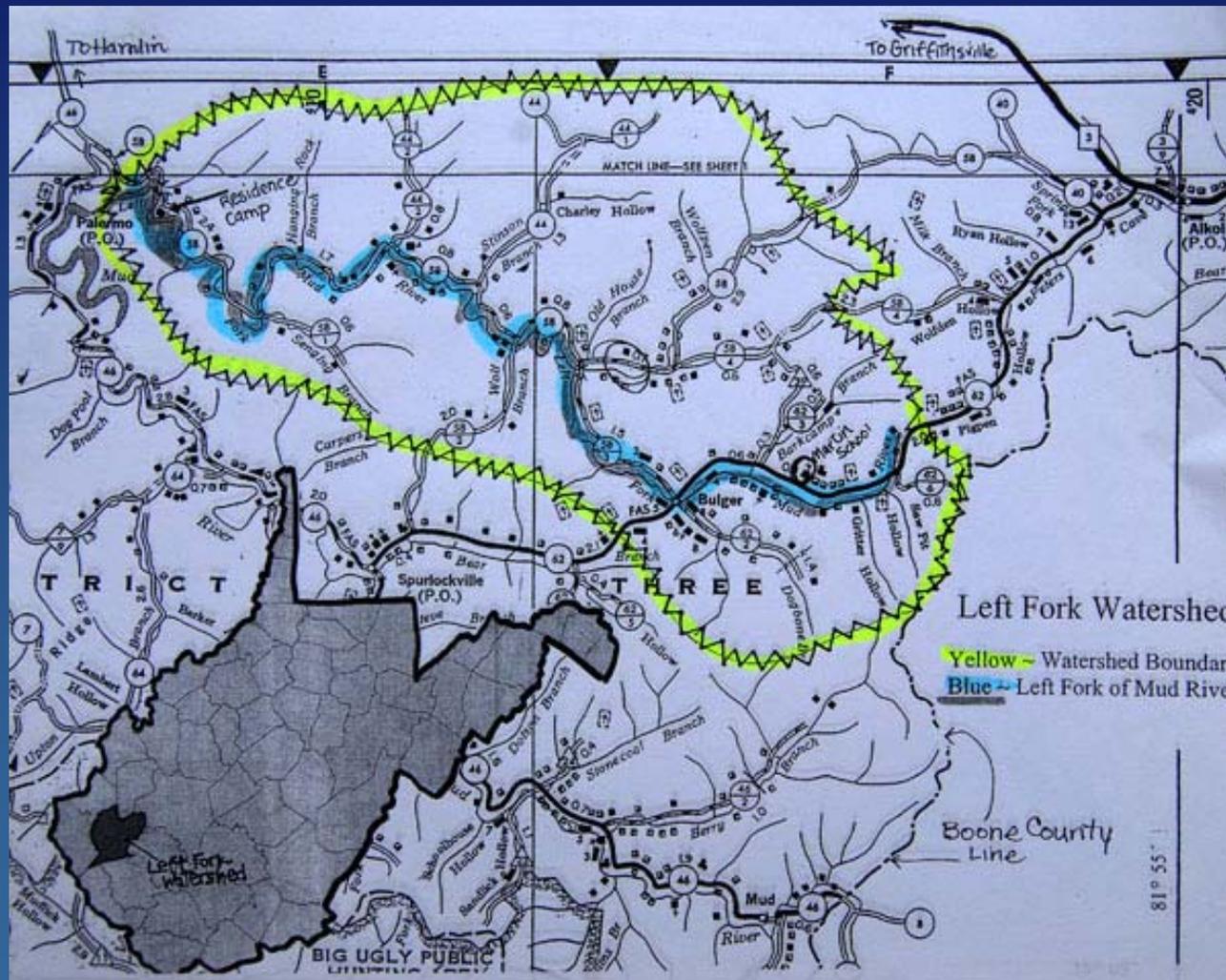


**Challenges, Successes, &
Lessons Learned:
Decentralized Wastewater Systems
2007 to 2012**

Left Fork Watershed of the Mud River

*October 26, 2012
District Sanitarians' Meeting*

Left Fork Mud River Watershed



Left Fork Watershed



**2000 Census put the USA median family at \$50,046.
Lincoln County the figure was \$28,297.**

Left Fork Watershed area, median family income was only \$19,120.

Community had lost its schools. Little to bind it together. No natural leadership base.

No public water. Everyone on wells. No public sewer. No active PSD.

Mud River Lake

Lake Reservoir ~ 306 Acres

Management Area ~ 1425 Acres



Project Beginnings



- 1998 Red Algae Bloom
- 1999-2000 Kellogg Community Partnership with WVU
- Two years of tributary sampling at 15 locations.
64% over E. coli limit of 200 colonies per 100 mL
- 2003 Federal Budget Appropriation from USEPA

Project Funding Streams

- **2005 to 2010. USEPA. \$1,023,559.**
 - **40 homes**
- **2010 to 2011. ARRA- WV DEP. \$718,626.**
 - **21 homes**
- **2011 to 2012. WV DEP - SRF. \$613,951.**
 - **24 homes**
- **2012 to 2013. WV DEP - SRF. \$759,760.**
 - **16 homes**

Project Objectives



- Replace failing home systems with decentralized systems and assess their effectiveness
- Reduce bacterial contamination in tributaries
- Empower local community as equal decision makers

Project Accomplishments



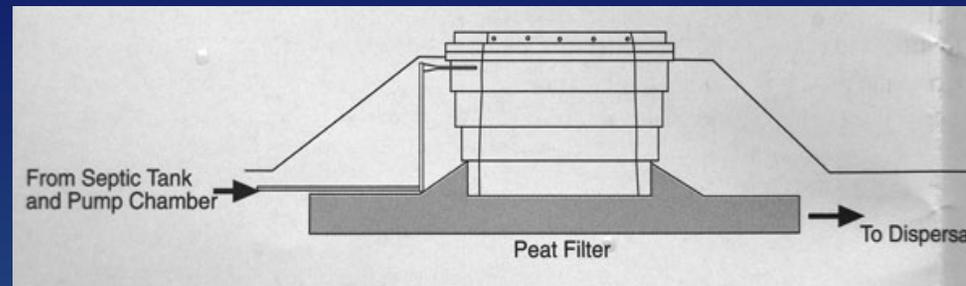
- Community created home ranking criteria for prioritizing system installations
- \$380,000 in-kind and cash raised locally for required match in Phase 1
- Project research has driven improvements in technology design, installation standards, and county regulations.
- Over 300 direct discharge samples

Project Accomplishments

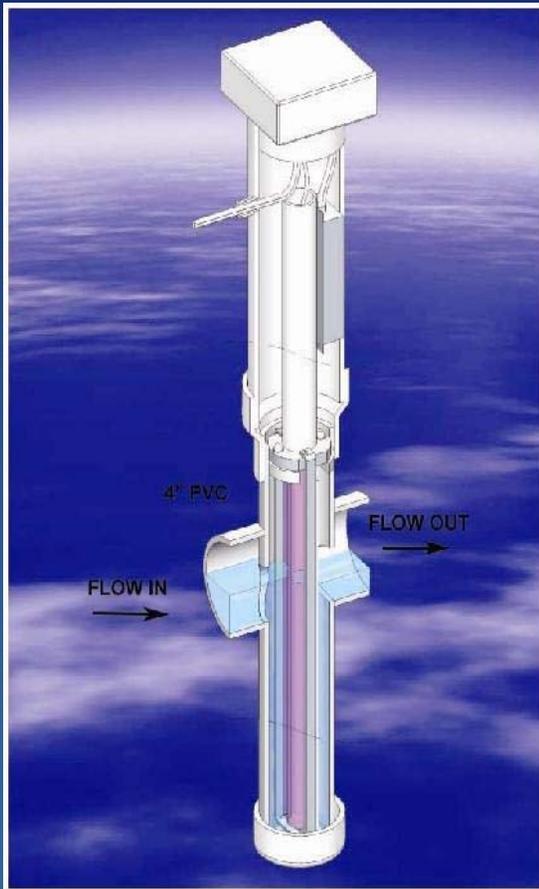


- Over 120 ongoing tributary samples demonstrate decreasing bacterial levels
- Community formed non-profit Wastewater Management Association
- Project research disseminated nationally
- Project sponsors training for sanitarians & Installers

Majority of Systems Are Peat



Most Discharge into Creek with UV Decontamination



A Few Inground LPP and Drip



Community Criteria for Selection:

- **Low Income Status**
- **High E. coli Levels**
- **Participation at Meetings**
- **Number of People in Home**
- **Threat to Public Health**



Project Challenges



- Soils often unsuited to either conventional or alternative inground systems
- Seasonal high water tables
- Homes located in flood plains
- Small lot sizes restrict type and placement of systems
- Concern about proper maintenance once systems are installed
- New systems cost more than many homes are worth

Human Challenges



- Lack of state or national models for projects like this in rural, low income communities
- Distrust by local communities of government, science, and academics
- Some distributors provide inaccurate information to installers
- Confusing and / or sometimes conflicting rules / philosophies among multiple state agencies

Problems Encountered in Project *Poor Installations*



Problems Encountered

New Concrete Septic Tanks Leaked

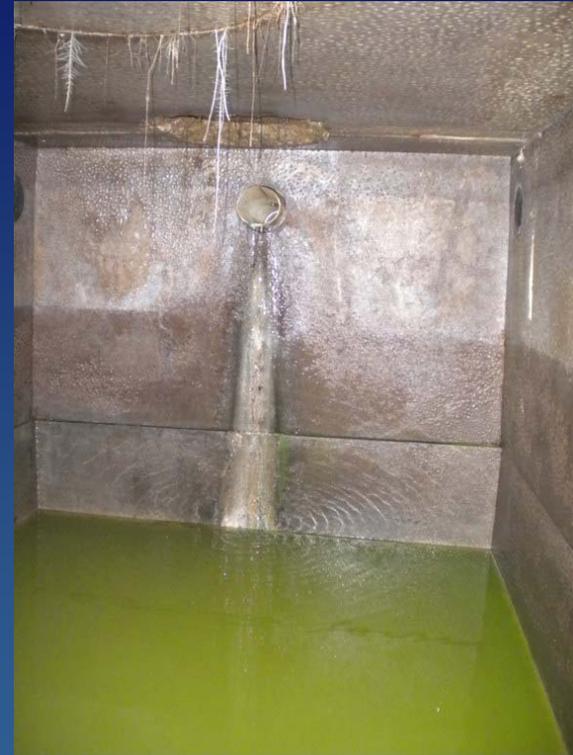


Problems Encountered

Concrete Tanks Leak over Time



Investigating for Leaking Tanks



Problems Encountered

Grease from Home



Problems Encountered

High E. coli after UV



Problems Encountered

Cracked, Leaking Riser Adaptors



Who Has Time to Monitor for Problems?

What Are the Indicators of Problems?

Who Bears the Cost?

Potential Actions at County Level

- **Move toward single county-wide PSD covering water & sewer**
- **Develop county-wide programs to manage conventional home systems**
- **Create tax credits for homeowners who replace failing systems**
- **Consider sewage design as water expansion happens**



Ways to Strengthen County Sanitarians' Roles

- Encourage increased time on site during system installations
- Support time to attend wastewater technology training



Long Term Potential Outcomes

- **Model cost effective systems and maintenance programs for low income communities**
- **Increase awareness of relationship of human health and water quality**
- **Develop local community leadership which can tackle other problems and needs**
- **Increase peoples' perception that government can help improve their lives**
- **Help create better inter-agency cooperation and understanding of realities low income people face**



Project Impacts

- **101 Homes Will Have New Systems by 2013**
 - **Tributary Bacterial Levels Decreased Dramatically**
- **National Systems Manufacturers Involved**
 - **Awareness Raised at State & Local Level of Importance of Wastewater Issues**

Project Findings Have Led to Changes in:

- ☑ Installation procedures
- ☑ UV component design
- ☑ Maintenance and inspection protocols

Critical Recommendations

- Increase technology-specific standards for maintenance inspections.
- Require ongoing training for maintenance providers and system installers.
- Support research into less high tech and lower cost systems, especially inground technologies.
- Require yearly inspections of all onsite wastewater systems without adding undue financial burdens on low income homeowners.

Special Thanks

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 - Jimmy Casdorff
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 - Folks at WV DHHR
- Lincoln County Commission