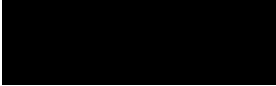

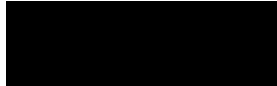



Concerns & Problems for Small Scale Wastewater Management



Sponsored by Orenco Systems®, Inc., 2002.

Issues & Opportunities for Decentralized Wastewater Management



Sponsored by Orenco Systems®, Inc., 2002.

“Adequately managed decentralized wastewater systems are a cost-effective and long-term option for meeting public health and water quality goals, particularly in less densely populated areas.”

USEPA Report to Congress, April 1997

The EPA reported that decentralized wastewater systems are cost-effective & possible long term options. However, they **MUST** be adequately managed in order to fill that role.

Adequately “managed” decentralized ww systems are cost effective and permanent long-term options for meeting public health and water quality goals (they addressed some barriers to overcome...list later)

Decentralized Wastewater Management

....decentralized wastewater systems are systems where the wastewater is collected, treated and reused at or near the point of generation...

Crites & Tchobanoglous, 1998

Issues & Opportunities

* Public Health Protection	* Operation & Management
* Environmental Protection	* Education
* Regulations	* QA/QC
* Planning	* Cost
* Management	* Cost
* Technology	* Cost

Public Health Protection

- * Prevention of health hazards
- * Pathogens . . . virus vs. bacteria
- * Drinking water protection
- * Shell fishing
- * And more

Environmental Protection

- * Nutrient loading to surface waters
- * Developmental impact

Regulations

- * How much planning
- * How much science
- * How much responsibility
 - Designer
 - Installer
 - Technology vender
- * Based on risk

Treatment Risk Approach

	Treatment Level	BOD ₅	TSS	Nutrient Reduction	Disinfection
T1	High Strength Septic Tank Effluent	>200	>150	No	No
T2	Domestic Strength Septic Tank Effluent	<200	<150	No	No
T3	Secondary Treatment	20	20	No	No
T4	Advanced Wastewater Treatment	10	10	No	No
T5 N	Advanced Wastewater Treatment + Nitrogen	20	20	Yes – Nitrogen	No
T5 P	Advanced Wastewater Treatment + Phosphorus	20	20	Yes – Phosphorus	No
T6	Advanced Wastewater Treatment + Disinfection	10	5	No	Yes

Treatment Risk Approach

Treatment Level	Application Rate Factor*	Vertical Separation induced WT/Leakage	O & M Requirement*	Comments
T1	0.5 gpd/sqft	36 in / 48 in	Annual	Requires lower loading rate due to solids loading
T2	1.0 gpd/sqft	36 in / 48 in	Every 3-5 years	Represents typical domestic strength
T3	3.0 gpd/sqft	18 in / 24 in	Annual	
T4	5.0 gpd/sqft	12 in / 12 in	Semi-annual	Higher application rates require pressure distribution.
T5N	3.0 gpd/sqft	18 in / 24 in	Semi-annual	To be used for nutrient sensitive areas.
T5P	3.0 gpd/sqft	18 in / 24 in	Semi-annual	To be used for nutrient sensitive areas.
T6	5.0 gpd/sqft	0 in / 0 in	Continuous	24-7 monitoring through remote telemetry.

Planning

- * It is your community
 - Science based regulations means decisions must be made where development is wanted
 - Farm land vs. homes
 - Houses on ridgelines

Management

- * Private vs. Public
- * Private & Public – appropriate roles

Technology

- * From simple to complex
 - Tanks to Telemetry

Operation & Maintenance

- * All systems need O&M
 - Some daily
 - Some every three years

Education

- * All stake holders need education
 - Professionals to homeowners
 - Consortium

**Quality Assurance /
Quality Control**

- * Evaluation
- * Design
- * Review
- * Installation
- * O&M
- * Monitoring
- * Evaluation

Cost

- * Technology
 - A good site is cheaper - \$3000
 - Technology - \$10,000 & up

Cost

- * O&M
 - Simple is cheaper - \$40/year
 - Technology - \$200/year

Cost

- * What is the cost if we don't?

Contact Info

- * Dave Cotton, Wastewater Technologies, Inc
 - 802 869-3432
 - dcotton@wastewatertechnologies.com
 - www.wastewatertechnologies.com
- * Orenco Systems, Inc
 - 800 348-9843
 - www.orenco.com
 - www.vericomm.net