WHY SHOULD YOU ATTEND?

The influx of excessive amounts of nitrogen from anthropogenic sources, including wastewater from residential septic systems, is greatly responsible for water quality degradation and habitat loss in our coastal waters. Eutrophication, excessive algal and plant growth in the water due to this over-abundant nutrient stimulation, reduces dissolved oxygen, clouds the water thus severely limiting light penetration, kills other organisms, degrades the aesthetic qualities of coastal waters, threatens recreational uses of waterways, and may severely hamper the commercial harvest of finfish and shellfish. Thus, developing low-cost efficient technologies that greatly reduce nitrogen loads from wastewater and other sources are critical to the health and sustainability of coastal waters.

At present, several types of onsite denitrification systems are in common use, but many questions remain about the cost and effectiveness of this first generation of technologies. This workshop will examine three new technologies in development that strive to markedly increase the amount of nitrogen removed from wastewater or groundwater, and conclude with a discussion of the policy and land use management implications of using these new technologies.

DIRECTION S

Waquoit Bay National Estuarine Research Reserve 149 Waquoit Highway (Route 28), E. Falmouth, MA

From Boston: Follow Route 3 South to the Sagamore Bridge over the Cape Cod Canal. Take Exit 2 (Route 130). Turn right off the ramp and follow 130 South 7.2 Miles to second light, just after Dunkin Donuts (on the left). Turn right onto Great Neck Road and follow to the Mashpee Rotary. Halfway around the rotary, take Route 28 North toward Falmouth/Woods Hole. The reserve is located 3.5 miles from the rotary on the left.

From Providence and Points West: Follow Route 495 or 195 to Route 25. Route 25 crosses over the Bourne Bridge and becomes Route 28. Follow Route 28 South to Route 151 (first exit after the Otis ANGB/Cataumet Rotary). Turn right off the ramp and follow 151 under the bridge to the Mashpee Rotary. At the rotary, take Route 28 North toward Falmouth/Woods Hole. The reserve is located 3.5 miles from the rotary on the left.

From the East: Follow Route 6 to exit 5 (Route 149 South). Follow 149 South towards Marstons Mills to Route 28. Take a right on 28 North (towards Falmouth). Follow Route 28 around the Mashpee Rotary and continue on 28 North towards Falmouth/Woods Hole. The reserve is located 3.5 miles from the rotary on the left.





Coastal Decision-Maker Workshop



Denitrification Systems:

New Technologies & Alternatives to Traditional Septic Systems

Tuesday, March 15, 2005 8:30 A.M. - 12:30 P.M.

Waquoit Bay National Estuarine Research Reserve 149 Waquoit Highway (Route 28) E. Falmouth, MA

G I S T R A T I O N W D U E 0 R K S H 0 S C H Ε **Denitrification Systems:** Tuesday, March 15, 2005 New Technologies & Alternatives to Traditional Septic Systems 8:30AM - 12:30PM 8:30 am - 9:00 am Registration & Continental Breakfast 11:00 am - 11:30 am NITREX Barriers in Coastal Applications Waquoit Bay National Estuarine Research Reserve This presentation will highlight an alternative 149 Waquoit Highway (Route 28) 9:00 am Welcome & Overview approach involving the placement of permeable reactive barriers along the shoreline that would New Technologies Supporting Nutrient 9:15 am - 9:45 am intercept and dentrify groundwater just prior to its Pollution Detection, Prevention, and release estuaries. The NITREX (r) Barrier, a mix Name_ Remediation of wood chips, sand and gravel that is matched to Since 1997, CICEET has funded over 120 the surrounding sediment deposit provide a slow technology research and development projects Organization. release carbon substrate that supports a active focused on addressing coastal management microbial community. Although NITREX barriers technology needs in the areas of microbial have been used to intercept and remove nitrates Address_ and toxic contaminants, nutrient over-enrichment, from septic systems, they have not been installed and habitat restoration. Close to one-guarter of the in coastal environments where they might be technology development projects have focused on subject to tidal inundations, high sulfate concentra-City, State, Zip_ the issue of nutrient pollution. This presentation will tions, and tidal pumping of groundwater. This highlight some of the technology achievements in reseach will examine the effects of these factors nutrient monitoring, prevention and remediation. Phone. and others on the function and efficacy of NITREX Dwight D. Trueblood, Ph.D., NOAA Co-Director barriers in coastal applications Cooperative Institute for Coastal and Estuarine Kenneth Foreman, Ph.D., Director Fax_ Environmental Technology(CICEET) Semester in Environmental Science, Marine Biological Laboratory **Biological Denitrification in On-site** 9:45 am - 10:15 am E-Mail Wastewater Treatment Systems 11:30 am - 12:00 pm Leachfield Aeration Technology: Improve-Sources of nitrogen input into estuaries and bays Space is limited please register early ment of Water Quality and Hydraulic will be presented to demonstrate the need for Functions in Onsite Wastewater Treatment denitrification of Title 5 effluents. Various methods Systems of achieving denitrification will be discussed with This project involves testing a new, relatively Telephone (508) 457-0495 ext. 108 special emphasis on biological processes. The inexpensive and non-invasive technology to microbiology of this process, along with carbon improve the hydraulic and water quality functions source for the microbes (autotrophic, heterotrophic, of leachfields. The technology employs aeration of FAX (617) 727-5537 mixotrophic) will also be discussed. leachfield soil, and has been shown to enhance Sarina Ergas, Professor absorption of water and, in preliminary sand-filled Univ. of MassachusettsCollege of Engineering mesocosm experiments the removal of nitrogen. laurie.tompkins@state.ma.us biochemical oxygen demand (BOD), and fecal 10:15 am - 10:30 am Break coliform bacteria. These features have the potential to increase adoption by homeowners and 10:30 am - 11:00 am Field-scale Studies with Biological Denitrifi-Waquoit Bay NERR state and local regulatory agencies, and thus to cation using Elemental Sulfur as an Electron lower inputs of nitrogen into coastal waters. P.O. Box 3092, Waquoit, MA 02536 Donor for Modified Title 5 Systems Jose A. Amador, University of Rhode Island The presentation will begin with a brief discussion of the chemistry, microbiology, and regulatory 12:00pm - 12:30 pm Now What: What Massachusetts aspects of the Title 5 system. Results of a field-scale Regulations Say You Can and Cannot Do There is no charge for the workshop. study that is ongoing at the Mass. Alternative Septic A workshop wide discussion of the policy, legal Pre-registration is preferred. System Test Center to achieve biological and land use management implications of using denitrification using elemental sulfur will be these new technologies in conjunction with current summarized. Preliminary steps toward commercial on-site denitrification systems. For additional information or questions please call -ization and the potential of this technology in (508) 457-0495 ext. 108. addressing denitrification challenges in other non-

point source situations will be discussed. Suku Sengupta, Professor, UMASS, Dartmouth,

Civil & Engineering Department