IA

NUTRIENT MANAGEMENT

Innovative / Alternative (I/A) Septic System

STRATEGY SCALE

THREATS ADDRESSED

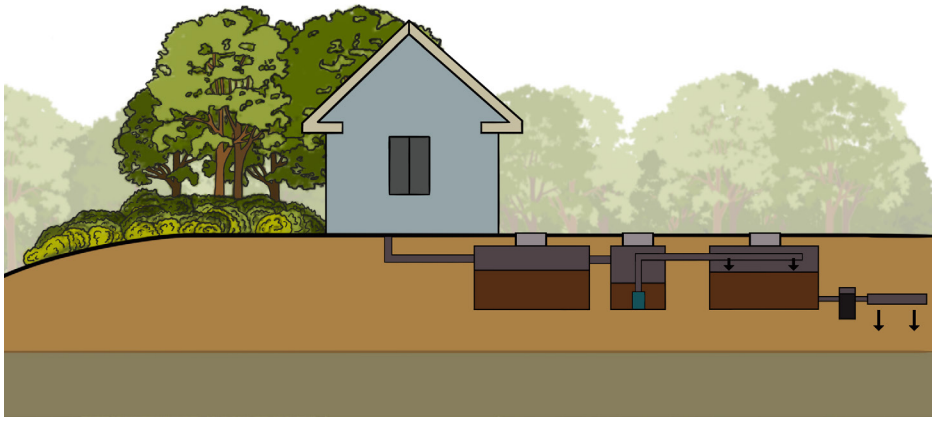
- ✓ Excess Nutrients
- ✗ Pollutant Inputs
- ✓ Algal Blooms
- ✗ Erosion
- ✗ Invasive/Nuisance Species

STRATEGY GOALS

- Protect ✓
- Manage ✓
- Rehabilitate ✓

STRATEGY CO-BENEFITS

- Habitat: Neutral
- Aesthetics: Neutral
- Recreation: Neutral



- ✓ **Permittable in Massachusetts**
  MassDEP Approved for Piloting Use under Title 5. Local Board of Health review. List of potential permits available here.
- ✓ **Implemented on Cape Cod**
  See examples of pond projects implemented on Cape Cod here.
- ✓ **Listed in 208 Plan Technologies Matrix**
  Learn more about the nutrient management strategies in the Tech Matrix here.
- ✓ **Can be Performed at Homeowner Scale**
  Local review and permitting may be required.
- ✗ **Nature-based Solution**

DURATION OF BENEFITS

- Less than one month ○
- One season or year ○
- Multiple seasons or years ●

MAINTENANCE REQUIREMENTS

- Monthly ○
- Annually ○
- Infrequent ●

DESCRIPTION

An I/A septic system is an alternative technology to a traditional onsite Title 5 septic system that is specially designed to treat wastewater beyond the capability of a standard (septic tank and leach field) system. The objective of using an I/A septic system is to prevent nutrients (mainly nitrogen and phosphorus) from entering freshwater ponds from septic effluent via groundwater. Multiple techniques include precipitation (using aluminum or iron rich media), ion exchange (using ion exchange media), and biological (using microorganisms) methods. An I/A system can be installed as a new system or a retrofit to an existing septic system. Most I/A systems have focused on nitrogen removal but there are some technologies that remove phosphorus. The Massachusetts Department of Environmental Protection (MassDEP) must approve alternative septic systems for use in Massachusetts.

ADVANTAGES

- Targets nutrients at the source
- When sited correctly, reduces external nutrient loading
- I/A septic systems can be similar to conventional septic systems from the homeowner perspective
- Decentralized approach can be implemented lot by lot, does not require a centralized collection system

CONSTRAINTS

- Can be expensive to install; however, tax credits and low/no interest loans may be available to help lower installation costs
- Depending on condition of existing system, may require a total replacement or component upgrades
- Systems have been developed and approved for nitrogen removal, but there is not an extensive list of phosphorus removing I/A systems to choose from and those available are being piloted in MA
- Precipitates / media / biosolids removal requires routine maintenance

Innovative / Alternative (I/A) Septic System

IMPLEMENTATION

POTENTIAL ACTORS

- **Towns:** Towns may propose the installation of I/A systems at town-managed ponds and provide a supportive role through permitting and education
- **Pond Groups:** May propose I/A systems around public or private ponds and provide a supportive role through education
- **Private Landowners:** May install I/A systems
- **Land Trusts:** Land trusts may provide a supportive role through education

SITING REQUIREMENTS

- All ponds with upgradient development (particularly within 300 feet) using Title 5 or other non-nutrient treating septic systems

INFORMATION NEEDS

- Survey / inspection of existing septic systems
- Wastewater flows and groundwater flow direction
- Nutrient sources, travel times, and distances

IMPLEMENTATION EXAMPLES

The *Massachusetts Alternative Septic System Technology Center* (MASSTC) collaborated on the approval, design, installation and/or monitoring of five phosphorus removing systems near freshwater ponds on Cape Cod. The objective of the project was to validate these technologies for protecting freshwater resources from phosphorus inputs from onsite septic systems.

RESOURCES

- MassDEP maintains a *list of approved Title 5 I/A technologies*.
- MASSTC has information on phosphorus removal in onsite septic systems *here*.
- The Barnstable Clean Water Coalition is working with partners to *install I/A systems in one neighborhood around Shubael Pond*.
- The Massachusetts' Department of Conservation and Recreation's *Lakes and Ponds Program* provides related resources.

COST ESTIMATE

Variable

Varies depending on technology and site conditions

ADDITIONAL FINANCIAL CONSIDERATIONS

Assessment: Planning, design, and permitting

Implementation: Equipment, supplies, and labor all vary depending on system

Maintenance: Inspections and septic pumping schedule depends on performance monitoring requirements

POTENTIAL FUNDING SOURCES

- **Community Preservation Act**
- **Capital Budget**
- **Grants**
- **Private Funding**

Additional information regarding potential funding sources is available ***here***.